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BLACK RIVER MANAGED RESOURCE PROTECTED AREA

St. Elizabeth, Jamaica

MANAGEMENT PLAN

March 1999

Prepared by

Technical Support Services, Inc.
Technical Assistance and Training Contractor

for

Natural Resources Conservation Authority
Protected Areas Management Branch

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Draft submitted to

Natural Resources Conservation Authority
Protected Areas Management Branch
and
United States Agency for International Development
Kingston, Jamaica

by

Alison Kenning Massa and Ann Haynes-Sutton
Technical Support Services, Inc.

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LIST OF ACRONYMS

BR	Black River
BRLM	Black River Lower Morass
BRPRPA	Black River Managed Resource Protected Area
BRUM	Black River Upper Morass
BRUMDEC	Black River Upper Morass Development Company
CBO	Community-Based Organization
CDF	Community Development Foundation
DEMO	Development of Environmental Management Organizations
EFJ	Environmental Foundation of Jamaica
EIA	Environmental Impact Assessment
ENGO	Environmental Non-Governmental Organisation
EPF	Environmental Policy Framework
FiD	Fisheries Division
FSCD	Forestry Department
GEF	Global Environmental Facility
GOJ	Government of Jamaica
IUCN	International Union for the Conservation of Nature
JAS	Jamaica Agricultural Society
JBI	Jamaica Bauxite Institute
JCDT	Jamaica Conservation and Development Trust
JCF	Jamaica Constabulary Force
JDF	Jamaica Defence Force
JET	Jamaica Environment Trust
JPSCo	Jamaica Power Supply Company
JNHT	Jamaica National Heritage Trust
JTB	Jamaica Tourist Board
LAC	Local Advisory Committee
LGRU	Local Government Reform Unit
LME	Local Management Entity
LDUC	Land Development and Utilisation Commission
MEH	Ministry of Environment and Housing
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOT	Minister of Tourism
NEEC	National Environmental Education Committee
NEST	National Environmental Societies Trust
NGO	Non-Governmental Organisation
NIC	National Irrigation Commission
NRCA	Natural Resources Conservation Authority
NWC	National Water Commission
ODPEM	Office of Disaster Preparedness and Emergency Management
PARC II	Protected Areas Resource Conservation Project
PCA	Pesticide Control Authority
PCJ	Petroleum Corporation of Jamaica
PIF	Project Information Form
PIOJ	Planning Institute of Jamaica
PVO	Private Voluntary Organisation
PWD	Public Works Department
QUANGO	Quasi Non-Governmental Organisation
RADA	Rural Agricultural Development
RPPU	Rural Physical Planning Unit
SCRB	South Coast Resort Board
SDC	Social Development Commission
SEEPA	St Elizabeth Environmental Protection Association
SPAW	Specially Protected Areas and Wildlife Protocol
SRC	Scientific Research Council
STATIN	Statistical Institute of Jamaica
STRAP	Sea Turtle Recovery Action Plan
TCPA	Town and Country Planning Authority
TPD	Town Planning Department
TPDCo	Tourism Product Development Company
UDC	Urban Development Corporation
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Program
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
UTECH	University of Technology
UWA	Underground Water Authority
UWI	University of the West Indies
WIWD	West Indian Whistling Duck
WRA	Water Resources Authority
WTO	World Trade Organization

1 INTRODUCTION

This draft plan provides a framework of policy and action for management of the proposed Black River Protected Area (see Figure 1 for location) It describes the vision to be achieved through establishment and operation of the protected area the desired outcomes (targets) and the management programs for achieving the targets and realizing the vision recommended by the Natural Resources Conservation Authority (NRCA)

The protected area has not yet been declared, nor has a local management entity been firmly identified The draft plan will therefore need to be reviewed and refined by the local protected area management entity or entities, once identified prior to full implementation by the local entity in conjunction with the NRCA Where possible and appropriate at this stage the management programs and plans include examples of specific actions based on input received to date However it is expected that the local management entity and other local organizations will add and further prioritize detailed proposals over time

1 1 The Purpose of Protected Areas

The expanding system of protected areas is an expression of Jamaica s commitment to protecting its environment and resources of recognized national and international importance Protected areas are crucial to preventing degradation of land and marine ecosystems and maintaining the island's extraordinary biological, scenic and cultural diversity They should also to varying degrees, conserve essential resources for sustainable use help to expand and diversify economic development and contribute to public recreation and education In most instances the creation of protected areas will not reduce the private use and ownership of land but will lead to more productive use on a sustained basis with local and national economic benefits

The Government s Protected Areas White Paper "Towards a National System of Parks & Protected Areas ' adopted in December 1997, established six goals for the system Economic Development Sustainable Resource Use Environmental Protection Recreation and Public Education Public Participation and Local Responsibility and Financial Sustainability (see Table1 1)

1 2 Steps in the Process of Establishing a Protected Area

The general process developed by the NRCA by the NRCA for establishing protected areas, as presented in the White Paper consists of the following ten steps

1 Initiation
2 Building of Community Participation
3 Assessment of Feasibility of Protected Area
4 Request for Declaration
5 Preparation and Submission of Management Plan
6 Preparation and Submission of Operations Plan
7 Review and Approval of Management and Operations Plans
8 Declaration
9 Delegation
10 Evaluation and monitoring

1 3 Initiation and History of the Proposed Black River Protected Area

Initiation (Step 1) of the protected area establishment process began long ago when a Black River Morass national park was first recommended in 1969 Numerous other recommendations have been made since that time

In 1986 a suggestion was made that the Lower Morass be nominated for declaration as a World Heritage Site In 1990, a study for the Jamaica Conservation and Development Trust (JCDT) (Conrad Douglas & Associates 1990) identified Black River [Lower Morass] as the prime candidate for Jamaica s next national park based on its ecological importance as well as the economic and social feasibility of protection It was hoped that protected area designation would set the standard for sustainable development of the south coast

The Black River area was included in the 1992 Draft Plan for a System of Parks and Protected Areas for Jamaica (JCDT 1992) In 1995 the PARC II Project proposed declaration of a national park encompassing the Upper and Lower Morass and parts of the adjacent mountains that surround and influence it None of these proposals or recommendations has come to fruition although portions of the area have been identified as conservation areas

1 4 Prior Proposals and Current Concepts

The delay in implementing the recommended Black River national park/protected area status has meant both lost and new opportunities Establishment of a national park ten years ago would have been a significantly easier task than it is today because of the limited commercial activity then dependent on the resources However during the intervening decade and especially the past four years experience with park management both locally and internationally has increased and wider dialogue has occurred regarding feasible options for managing protected areas in Jamaica

The White Paper on Protected Areas presents a new vision of what constitutes a protected area and describes a process whereby a local organization which may be the parish council an NGO a CBO a public or private organization or a private individual can propose declaration of a protected area and/or offer to take on management or co-management with the NRCA The White Paper also describes the criteria that a prospective management organization must meet and the steps it needs to follow in order to have management authority delegated to it by the NRCA The co-management approach responds to the financial limitations that make a centrally managed system of parks infeasible More importantly it responds to the fact that strong partnerships with stakeholders including local resource users are essential to effective management and achieving the desired transformation to sustainable practices

1 5 The Draft St Elizabeth Environmental Policy Framework

The building of community participation in and assessment of the feasibility of a Black River protected area (Steps 2 and 3 in the establishment process) were furthered in 1997 and 1998 when the NRCA initiated work leading to the drafting of an Environmental Policy Framework (EPF) for the Parish of St Elizabeth

The draft EPF

- Identifies the various public and private interests and agencies with a stake in the environmental quality of St Elizabeth and its critical wetland (Black River Morass) mountains and coastal ecosystems
- Examines the feasibility of and provides the justification for establishment of a protected area covering the Black River Upper and Lower Morass and adjacent coastal region and
- Presents draft visions and policies for environmental management of the surrounding watershed to minimize adverse influences on the quality of the proposed protected area

The draft EPF is to be circulated by the NRCA for review by all stakeholders including all of the residents of St Elizabeth business entities users of the local natural resources community and non-governmental organizations government agencies with a role in regulating activities affecting the area s environment

As part of the process of developing the draft EPF and feasibility study the NRCA in 1997 carried out a survey that led to the recommended classification of Black River as a Managed Resource Protected Area [1 2] The classification and boundaries are open to review and modification as discussed later in this draft Management

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[1]The White Paper offers six types of protected area that correspond to those recommended by the International Union for the Conservation of Nature (IUCN) and allow a variety of management options to respond to varying levels of need for protection or intervention to improve conditions and varying suitability for productive use including local community subsistence education scientific research recreation and specialized tourism

[2] See Draft EPF Annex C for the NRCA s Black River Categorization and Boundary Survey April 1997

Plan The Black River Lower Morass (BRLM) was designated a Wetland of International Importance in February 1998 under the Ramsar Convention However no formal application for declaration of a Protected Area within Jamaica s expanding system of protected areas (Step 4) has yet been made

By implementing the EPF the NRCA has developed a mechanism for community/stakeholder participation and has provided a basis for declaration (Steps 1-4 and 8) This draft management plan (Step 5) should be read in conjunction with the draft EPF The draft plan is a preliminary effort by the NRCA in its role as lead agency for protected areas in general and in this case as the management entity for the interim period required prior to delegation of management authority to a Local Management Entity (LME)

1 6 Relationship of the draft EPF to Protected Areas

An EPF aims to bring increased coordination based on a collective vision to a variety of public and private actions that affect the environment usually on a watershed basis One of the tools of an EPF is establishment of Protected Areas

The draft St Elizabeth EPF covers the entire parish but pays particular attention to conditions within the proposed Black River Morass Protected Area and other possible Protected Areas The parish-wide scope of the EPF acknowledges the dependence of enhanced and sustained environmental quality in a protected area on coordinated management of the areas that surround and affect it The EPF therefore

- ensures that the proposed Protected Area or areas are not established or managed in isolation from the social and ecological context
- considers outlying regions of special significance
- supports identification of comprehensive visions policies and actions to control or eliminate sources of pollution outside but affecting the Protected Area(s) and
- allows better prediction and management of indirect and cumulative environmental impacts

Among the many practical reasons for pursuing collective implementation of the EPF are the critical needs to manage the influences on the proposed protected area and especially to

- control dunder releases to the Black River system from Appleton Estate, north of the Nassau Mountains,
- protect productive value of the Santa Cruz Mountains as a backdrop to the Black River Morass and contributor to the environmental quality of the Black River region by preventing inappropriate deforestation and mining, and
- manage the environmental quality of linkages to a future Protected Area covering the Cockpit Country upon which the Black River system's hydrologic regime depends

1 7 The Co-Management Partnership

Guiding principles for ensuring permanent protection of important natural areas include sustainable management programs and local co-management The stakeholders in the environmental quality of the parish also have a stake in the success of the proposed protected area and management plan Successful implementation of the plan will depend to a great extent on the cooperation of all stakeholders in both sustainable practices and protected area management

1 8 Values and Goals of the Black River Protected Area

The definition of a Managed Resource Protected Area provided in the White Paper summarizes the basic goal of the proposed protected area

> [A Managed Resource Protected Area designation is] 'appropriate for lands and waters with important natural resource and environmental values They are managed primarily for sustainable consumptive use of natural resources (e g forestry fishing water supply) combined with environmental conservation Secondary uses include tourism recreation research and education

The designation recognizes the multiple uses for which the area is now and may potentially be used It aims for minimum restriction of those uses consistent with effective action to counter the environmental threats identified in the draft EPF

1 9 Purpose of the Draft Management Plan

The approved Management Plan will guide the NRCA and its local management partner(s) by setting out a coordinated and prioritized program of action designed to

- protect and restore critical habitat and resources
- modify unsustainable practices
- eliminate conflicts between or among existing uses and
- support future activities and resource uses that will bring stakeholders more sustainable and more profitable use of the protected area s resources

1 10 Approach to Management Plan Preparation

The drafting of the Black River Management Plan has been undertaken with NRCA staff and a small number of local leaders as a Core Planning Team ' However it has not been possible to prepare the plan within the context of full public dialogue on the draft Environmental Policy Framework (EPF) which is still under review by the NRCA

The recommendations of the draft Management Plan are meant as a starting point for discussion of how to implement a central proposal of the draft EPF Like the EPF the draft management plan must be presented to the public for discussion before taking further action Such discussions must reassure government and public alike that

"1 difficult subjects and issues will not be overlooked or sidestepped,
2 solutions will not be proposed until a proper review of the issue(s) is completed, and
3 approaches are sensitive to the perspective of various vested interests and interested parties among stakeholders as well as among government officials and agencies " (UNEP 1996)

It is the NRCA s intention to present both the draft EPF and the draft Management Plan at the same time to meetings of the Parish Council St Elizabeth Environmental Protection Association (SEEPA) the South Coast Resort Board (SCRB) and other stakeholders Although the intention expressed in the draft EPF is for sequenced review it is anticipated that considering the two documents together will have benefits With the draft Management Plan in hand prospective local protected area management groups will have an opportunity to make input to the EPF gain a clear picture of the needs for and responsibilities of local management and make practical recommendations for achieving the vision expressed in the draft EPF and this document

The proposed boundaries of the protected area have not received full public review and are therefore still open to revision Secondly because a management organization is not in place the management options described in the EPF still exist The draft management plan therefore considers the advantages and disadvantages of boundary and management options makes recommendations presents criteria to be used in making decisions and proposes a process for making those decisions Other open issues that require full stakeholder input are treated in a similar manner

The text is presented in a format designed to facilitate review stakeholder decisions and preparation of final text by distinguishing text that is based in fact and accepted policy from text that includes options for debate and selection On the matter of stakeholder involvement the core group of staff and local leaders is expected to carry on the review process using the options criteria and decision-making process laid out in the text and at the conclusion of those meetings finalize the document

1 11 Contents of the Draft Management Plan

The following chapter discusses the basis for the recommended protected area type and boundaries together with further options Chapter 3 summarizes the important environmental characteristics of the proposed protected area This is not intended to repeat the information contained in the draft EPF but to provide a brief

foundation from which the user will be able to trace the logic of the recommended management programs

Chapter 4 distills and defines the vision for the protected area from the overall vision for the parish expressed in the draft EPF The core of the Management Plan is Chapter 5 which presents a series of focused management programs (Administration and Staffing Resource Protection and Conservation Recreation and Tourism, Legislation and Enforcement Public Education Public Relations, Promotion and Interpretation and Research Monitoring and Evaluation) The latter are supplemented by detailed sub-areas and species management plans Chapters 6 and 7 address monitoring and evaluation and operations and financing

The entire Management Plan has been designed as a modular document Chapters 3 and 4 are foundation chapters, while the remainder are intended to be read and used either as part of the complete document or as stand-alone chapters Thus an organization institution or group wishing to focus on implementation of a particular Sub-programme such as Education and Interpretation will find the necessary guidance in that Sub programme, together with Chapters 3 and 4 and the Zoning Sub-programme and any sub-area plan in which there is particular interest Similarly, a local organization such as the Treasure Beach Citizens Association will find the guidance it needs in the Treasure Beach Sub-Area Plan

The Management Plan has also been designed to ensure that no matter the geographical or topical starting point, implementation of Action Plans will support achievement of the overall vision and desired outcomes

It is hoped that the reader of the entire document will therefore appreciate the necessity for some repetition of information

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Table 1 1 Goals of Jamaica's Protected Area System

Goal 1 - Economic Development Expand and diversify Jamaica's natural resource based economy

- Improve and sustain the livelihoods of individuals and local communities by increasing their earning capacity
- Protect the supply and quality of basic natural resources that support most economic activity including water air and the productive land base
- Promote environmentally sound land management and research into production and harvesting practices
- Use the opportunities presented by the protected areas system to research improved methods of sustainable resource use
- Ensure that the protected area system contributes significantly to the sustainability of the critical tourism sector by protecting beaches coastal waters coral reefs mountains forests wildlife nature interpretation and cultural opportunities and internationally-recognized protected areas

Goal 2 - Environmental Conservation Conserve Jamaica's heritage as represented by its biodiversity, scenic landscapes and cultural resources

Jamaica is home to a rich array of living organisms whose genetic diversity and relationships with each other and with their physical environment constitute the island s biodiversity

- Preserve major representative stocks or areas of all of Jamaica's biological resources including populations of indigenous animal and plant species natural communities and ecosystems
- Preserve major or representative components of Jamaica s natural and cultural heritage - including wildlife vegetation habitats genetic resources landscape types prominent natural features historic sites and buildings as well as treasured vistas and scenic areas - and provide for their compatible use and enjoyment by the Jamaican people and others

Goal 3 - Sustainable Resource Use Protect ecological systems which provide goods and services

- Restore protect and enhance watersheds rivers wetlands, coral reefs and other important ecosystems so that essential resources, such as water soil trees wildlife, fish and shellfish, are available for sustainable economic use
- Restore and protect ecosystems such as coral reefs beaches and dunes wetlands and forested hillsides that maintain life-support processes and reduce risks from natural disasters

Goal 4 Recreation and Public Education Provide recreational and educational opportunities to improve the quality of life for all Jamaicans and visitors

- Provide outdoor recreation opportunities and services for the Jamaican public and visitors in ways and at levels compatible with the protection and sustainable use of natural areas
- Promote greater understanding of ecological systems and their components by preserving natural systems and providing opportunities for ecological and other scientific research
- Promote environmental educational opportunities
- Promote appreciation of historic and cultural resources and landscapes reflecting appropriate traditional responses to the natural environment

Goal 5 Public Participation & Local Responsibility Promote local interest, commitment and support for protected areas

- Provide for the participation of all interested groups and individuals in all aspects of protected area planning and management.
- Confer responsibility for planning and management of protected areas on qualified local groups through delegation of authority

Goal 6 - Financial Sustainability Achieve and maintain financial sustainability for the protected areas system

- Plan for the generation of adequate revenue for the system from a broad and varied set of sources including the use of trust funds and other mechanisms
- Encourage individual protected area sustainability through local fund raising user fees and control of costs to ensure affordability

2 PROTECTED AREA TYPE AND BOUNDARIES

2 1 Existing Conservation Areas

The area under consideration includes areas and sites which have been gazetted under several laws and are administered by various agencies (see Table 2 1 and Figure 2 1) These designated conservation areas include Forest Reserves (managed by the Forestry and Soil Conservation Department) Game Sanctuaries managed by NRCA and Protected National Heritage sites managed by the Jamaica National Heritage Trust (JNHT)

In no case does legal designation contribute significantly to protection Private conservation areas such as YS Falls and Font Hill, have tended to fare better despite concern about the intensity of development at by the Petroleum Corporation of Jamaica (PCJ) at Font Hill Beach

2 2 Prior Protected Area Proposals

The most important of many proposals for protection in the Black River area are summarized in Table 2 2

The draft EPF also notes that protected area status has been proposed from time to time for the mountains that surround the wetlands including the Lacovia Mountains the YS Corridor, the southern Cockpit Country the Nassau Mountains (in part owned and protected by Appleton Estates) the Santa Cruz Mountains, and the Don Figueroa Mountains within the Black River watershed All of these mountains have an influence on the quality of the Black River Morass and the adjacent coast In the case of the Cockpit Country, the source of the river system s water balance the influence is profound

Table 2 1 Features with Existing Protected Status

TYPE OF PROTECTION	RESPONSIBLE AGENCY	AREAS/SITES
FOREST RESERVES	Forest Department Ministry of Agriculture	Lovers Leap (Yardley Chase)
GAME SANCTUARIES	NRCA	Black River Upper Morass Black River Lower Morass Parottee Ponds Luana/Font Hill
CONSERVATION AREA	Town Planning Department	Most of the coast from Font Hill to Little Pedro Bay Upper and Lower Morasses
PROTECTED NATIONAL HERITAGE	Jamaica National Heritage Trust (managed by Superintendent of Public Gardens)	Ashton Great House Magdala House and Spa Spring Park Black River Court House Black River Police Station Black River Spa Lacovia Tombstone Bamboo Avenue
WETLAND OF INTERNATIONAL IMPORTANCE	NRCA	Black River Lower Morass

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Table 2 2 Prior Black River Area Protected Area Proposals

PROPOSAL	AREAS	TYPE
Wild Life Protection Committee (1969)	Black River Upper and Lower Morasses	Unknown
National Physical Plan (1978 1998)	Luana/Font Hill Black River Lower Morass Black River Upper Morass (including Parottee)	Small Inland Conservation Area Large Inland Conservation Area Large Inland Conservation Area
Peat Resources Utilization Study (1981)	Black River Lower Morass	National Park
South West Coast Development Study (1992)	Black River Lower Morass Luana/Font Hill Black River town	National Park
Protected Areas System Plan (1992)	Black River Lower Morass including Pedro Ponds and Luana/Font Hill (with link via YS River to Cockpit Country)	National Park Conservation corridor
PCJ (date?)	Font Hill	Private and public wildlife refuges
Local residents (date?)	Pedro Beach Back Seaside Pedro Bluff	Private nature reserves
NRCA (1997)	Black River Lower and Upper Morasses	Managed Resource Protected Area
St Elizabeth Environmental Policy Framework (EPF) (draft 1998)	Black River Lower and Upper Morasses including surrounding hills Luana/Font Hill Parottee Pond to Starvegut Bay Treasure Beach	Managed Resource Protected Area
St Elizabeth EPF (draft 1998)	Black River Upper Morass	Ramsar Wetland of International Significance
South Coast Development Plan (Halcrow 1999)	Black River National Park and Pedro Ponds and Bluff	South Coast Heritage Coastline Natural Landmark

2 3 Proposed Black River Protected Area Type

The NRCA recognizing that different areas have different needs has defined six types of Protected Area for the Jamaican System of Protected Areas consistent with the categories recognized by the International Union for the Conservation of Nature (IUCN) Jamaican law (the NRCA Act) recognizes only two of these classes at present national parks and marine parks It is intended that the remaining four classes will receive legal status in the upcoming amendment of the NRCA Act It is further intended that the various existing protected or conservation area categories (forest reserves game sanctuaries etc) will be harmonized within the six types of protected areas The distinct characteristics and management purposes of each type are presented in the draft EPF Table 5

The NRCA has proposed that the Black River Protected Area be designated a Managed Resource Protected Area equivalent to Category VI in the IUCN classification system

2 4 Proposed Black River Protected Area Boundary

The boundaries of the Black River Protected Area proposed by the NRCA in 1997 are shown on Figure 5 of the draft EPF They include the Upper and Lower Morass and Parottee The NRCA also proposed separate protected area status for Luana-Font Hill

2 5 Options for Protected Area Establishment

In reviewing the draft EPF and this draft Management Plan, it is desirable to consider expanding the Black River Protected Area boundaries to achieve more efficient management

The main choice to be made is between

- a single large or very large protected area that will integrate management of the upper and lower morasses and surrounding areas in one management unit, with a fairly complex system of zoning, and
- a series of smaller independent protected areas of various types

Option 1 The first vision would see a single large local agency overseeing an integrated protected area which would be contiguous with the future Cockpit Country protected area and would extend south to the 200m benthic contour from Scott's Cove in the west to Little Pedro Bay in the east The area would encompass all of the proposed and existing protected areas It is proposed that the area would be divided into subareas whose citizens would develop and manage their own projects

Option 2 This would see a single smaller protected area covering all the wetland and coastal ecosystems, addressing the Upper and Lower Morass Luana-Font Hill Parottee, and extending south to Pedro Bluff and possibly to Lovers Leap as sub-areas

Option 3 The alternative would be to identify and, over time, establish a series of independent protected areas In the wetland/coastal area these would be Luana/Font Hill Black River Lower Morass Black River Upper Morass, Parottee Treasure Beach/PedroBluff/Pedro Ponds and Lovers Leap/Yardley Chase/Little Pedro bay Their integration and coordination would more likely occur on an *ad hoc* basis

2 6 Evaluation of the Options

Considerations Governing Selection The following considerations may be used to guide selection among the options

- Biological – How best to ensure effective management of biological resources?
- Management – How to define boundaries in the most practical and useful terms?
- Cultural – How to maximize community participation?
- Social and Economic – How to make best use of limited human and financial resources?

Biological Considerations From the biological point of view there is a very strong case for a single large protected area A large area will support

- Management of wetland and coastal ecosystems from "ridge to reef" and from source of impact to area of maximum impact
- Coordinated management of special ecosystems with greater opportunity for "trade-offs" (i e protection of one area in return for more intense use of another)
- Coordinated management of habitats of rare and endangered species throughout their local range For many rare and endangered species the sub-areas would be too small to support distinct populations

Administrative Considerations From a management standpoint, there are also strong arguments for a strong central organization which could provide support systems for sub areas and projects, as opposed to a series of independent protected areas A single organization should result in an organization with the capacity to hire highly-qualified staff and economies of scale with some equipment and vehicles being able to service more than one project It should

also be a more powerful advocate of good environmental management

The risk is that the single organization may be stretched too thin trying to do too many things over too wide an area It could become overly bureaucratic and stifle rather than stimulate the sub-area projects If the area is not too big problems should be surmountable by an organization whose structure is carefully planned from the start

Cultural Considerations Culturally there are similar concerns The protection of the whole area is a flagship project that should command very broad support However involvement in management is more likely to engender support if it is focused on local projects There are very few people with the interest knowledge time and skills to contribute to managing conservation projects in St Elizabeth Therefore it is important to provide a structure that makes the best use of the available resources This is likely to be found in a single umbrella project, with many sub-projects

Social and Economic Considerations From an economic viewpoint there are many advantages to the large area options since there will be one main office and a pool of equipment and skills It should be possible to use a portion of the revenues from economically successful projects to subsidize those which have little or no prospect of being self-sustaining However careful planning will be essential to ensure that resources are used effectively on selected and carefully prioritized projects rather than frittered away

Comparison of Options 2 and 3 It is clear from the foregoing that Option 3 is the least desirable A further comparison of Options 1 and 2 follows

Option 1 would in theory offer ridge to reef' management However it would suffer the administrative disadvantages of very large size without the advantages of strong ecological linkages From the biological social and cultural points of view despite their environmental relationships the mountains are different from the wetlands and coast With the exception of the Cockpit Country which needs urgent protected area declaration and management in its own right the mountains may be managed adequately through implementation of the EPF If additional protection is required (for example to assist with Santa Cruz Mountain restoration and protection from inappropriate resource extraction) they may receive separate protected area status or be added to the Black River Protected Area once it is well-established

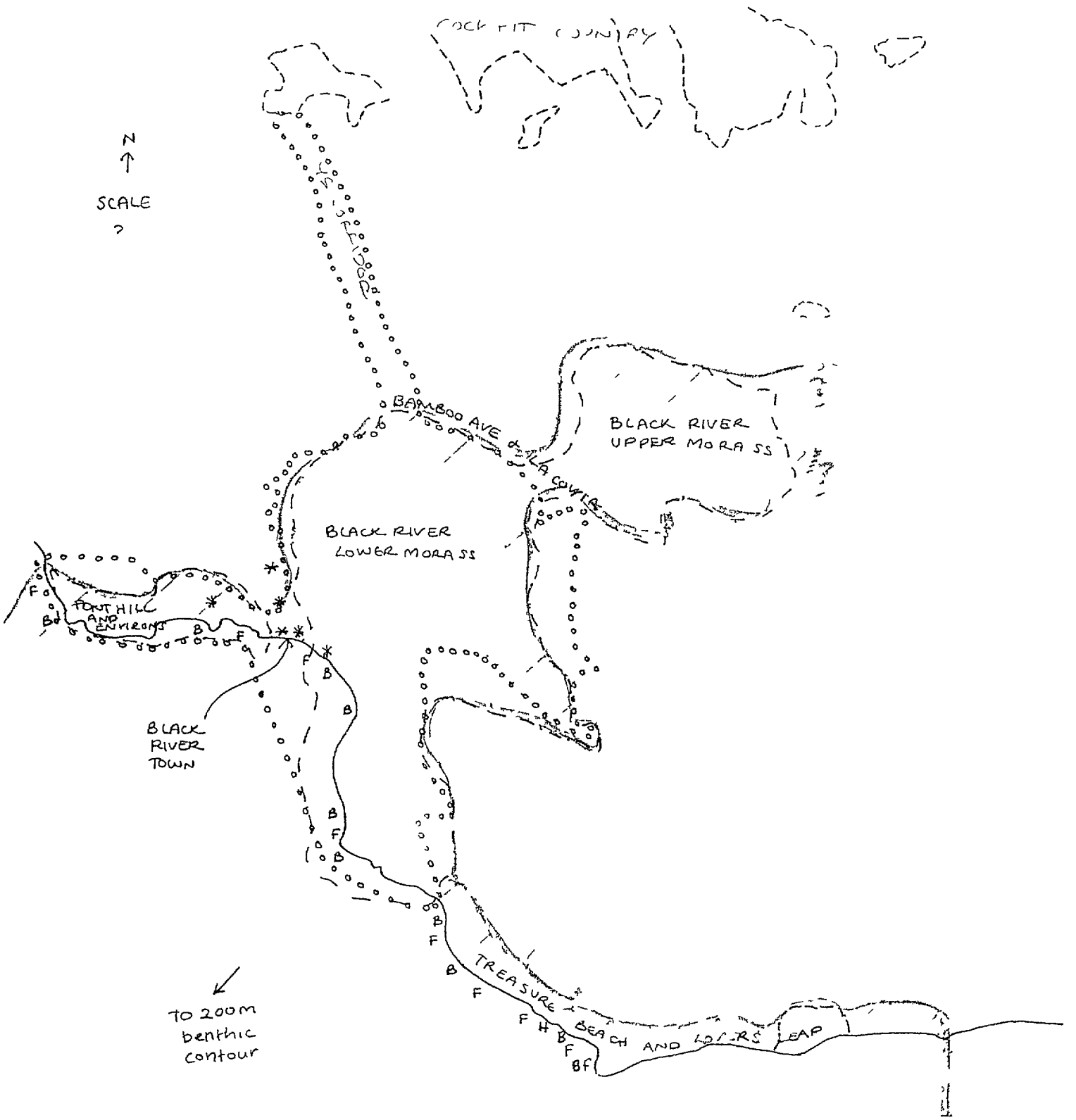
Option 2 covers an area of strong ecological linkages extending over the range of larger species particularly manatees and crocodiles as well as the West Indian Whistling Duck and many other bird species which migrate among habitats or areas diurnally seasonally or opportunistically in response to food or habitat availability The area also covers existing communities groups and organizations that acknowledge a strong link to the Black River Morass These include PCJ which has expressed interest in operating under an umbrella organization the Treasure Beach community organizations which wish to add strength to the management of the overall protected area and the fishermen along the coast from Parottee to Pedro Bluff who occasionally fish in or transport people to the Black River

2 7 Recommended Option

From this examination Option 2 emerges as the most advantageous supporting a recommendation that the proposed Protected Area boundaries be modified in accordance with Option 2 The remainder of this draft Management Plan therefore addresses that area and makes the assumption that the management model will be that of an umbrella covering the entire wetland and associated coastal area with sub-areas and projects overseen by a growing array of member groups and organizations

The recommended boundaries are shown in Figure 2 2 together with the seven sub-areas
Luana/Font Hill
Black River Town
Black River Lower Morass
Black River Upper Morass
Lacovia-Middle Quarters Corridor
Treasure Beach
Lovers Leap

ACTUAL AND PROPOSED PROTECTED AREA BOUNDARIES



KEY TO ACTUAL AND PROPOSED PROTECTED AREA BOUNDARIES			
– – – –	Forest Reserve	*	Historical Site (JNHT)
	St Elizabeth Development Order 1983	F	Fishing Beach
– – –	JCDT 1993	B	Public Bathing Beach
ooooo	NRCA 1997	H	Hotel Beach
	CURRENT PROPOSAL		

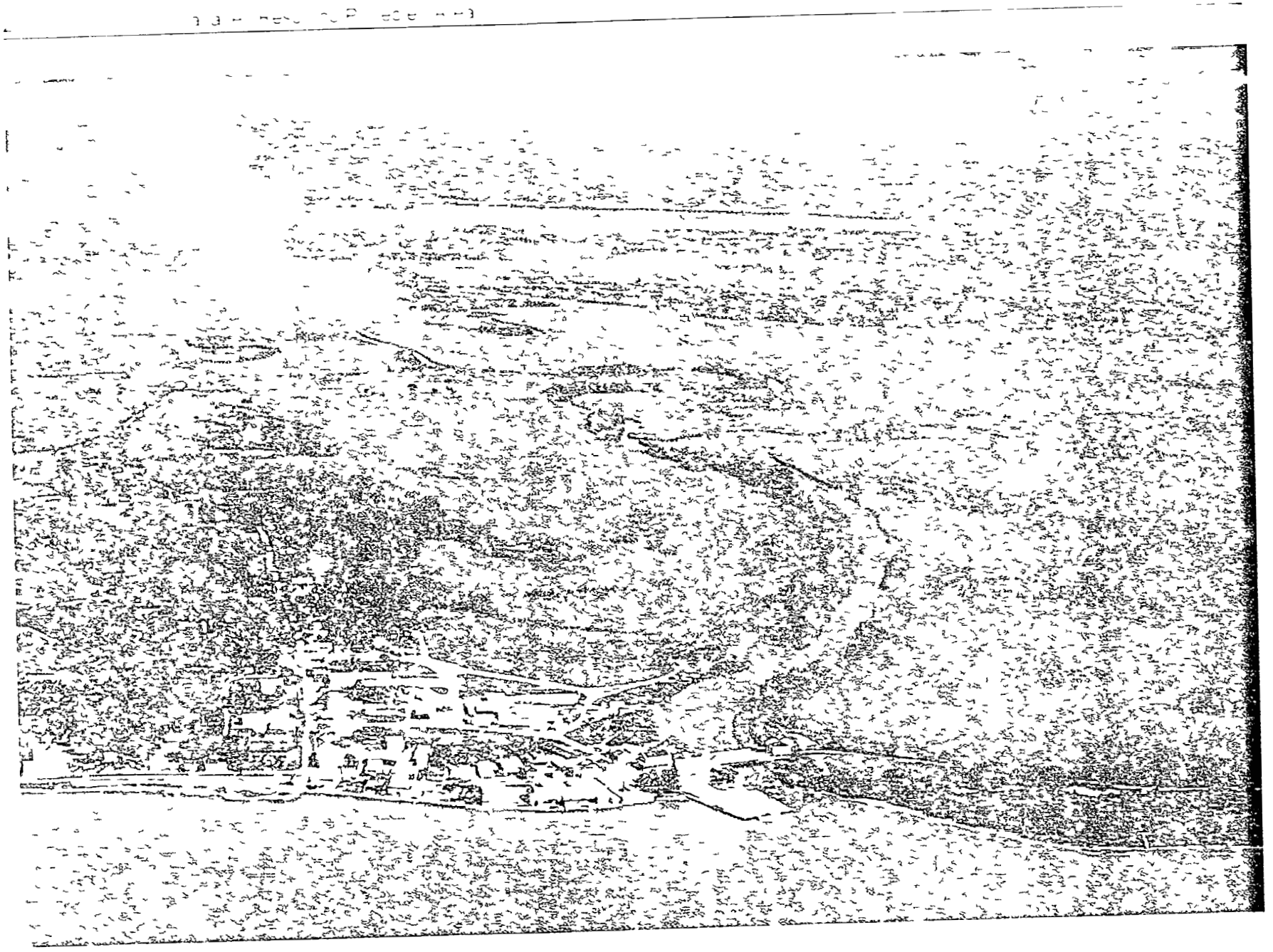


Figure 2 2 Aerial View of the Black River Morass (1986)

3 EXISTING CONDITIONS

This summary of existing conditions should be read in conjunction with the draft Environmental Policy Framework for St Elizabeth The information is intended to provide a brief framework to assist the reader and user of the Management Plan in understanding the vision for the proposed Protected Area (Chapter 4) and the recommended program of action (Chapter 5) More detailed information specific to the proposed Protected Area is provided where appropriate in the Sub-programmes as well as in Special Area Plans (Chapter 6)

3 1 Laws, Policies and Government Programs

Jamaica s expanding system of Protected Areas is at the highest level a response to the country s obligations under various international conventions Jamaica is a signatory to the Convention on Biodiversity (1992) the Convention on Wetlands of International Importance Especially as to Waterfowl Habitat (Ramsar 1973) the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973), and the Convention on Specially Protected Areas and Wildlife (SPAW, 1983) The intent of each is outlined in the following boxes

The Convention on Biodiversity aims for the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from use of genetic resources

The convention requires Jamaica (among other obligations) "as far as possible and as appropriate, to

1) establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity
2) develop where necessary guidelines for the selection establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity
3) regulate or manage biological resources important for the conservation of biological diversity whether within or outside of protected areas with a view to ensuring their conservation and sustainable use,
4) promote the protection of ecosystems natural habitats and the maintenance of viable populations of species in natural surroundings
5) promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas
6) rehabilitate and restore degraded ecosystems and promote the recovery of threatened species *inter alia* through the development and implementation of plans or other management strategies and
7) develop and/or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species "

The Ramsar Convention commits Jamaica to

a) promote the conservation of wetlands and waterfowl by the establishment of nature reserves on wetlands[1] whether or not such wetlands are on the International List, and b) provide for the wardening of wetlands

Jamaica has begun to meet one obligation under the convention the designation of suitable wetlands for inclusion in the List of Wetlands of International Importance maintained by the IUCN The Black River Lower Morass was so declared in February 1998 Declaration of the entire Morass and related wetlands along the St Elizabeth coast as a Protected Area and Ramsar site will further Jamaica s compliance with Ramsar and reap the accompanying benefits of international recognition

1 Defined in the Convention as areas of marsh fen peatland or water whether natural or artificial permanent or temporary with water that is static flowing fresh brackish or salt including areas of marine water the depth of which at low tide does not exceed six meters Wetlands function as regulators of water regimes and habitats for flora and fauna including waterfowl

The CITES Convention established a permit and certification system for the exportation importation and re-exportation of specimens of species threatened with extinction Jamaica is required to classify species ranging from those which face an immediate threat of extinction to those which may become extinct if adequate protective measures are not put in place Jamaica is obligated to issue permits and licenses in accordance with the controls identified for each category of classified species and to so identified (a function carried out by the NRCA) and to take appropriate measures to enforce other provisions including the prohibition of trade in endangered species The protected areas system has a supporting role to play in implementing CITES

The SPAW Protocol calls for signatories to establish protected areas to conserve maintain and restore

a) representative types of coastal and marine ecosystems of adequate size, to ensure their long-term viability and to maintain biological and genetic diversity

b) habitats and their associated ecosystems critical to the survival and recovery of endangered threatened or endemic species of flora and fauna,

c) the productivity of ecosystems and natural resources that provide economic or social benefits and upon which the welfare of local inhabitants is dependent and

d) areas of special biological ecological educational scientific historic cultural recreational archaeological aesthetic or economic value including in particular areas whose ecological and biological processes are essential to the functioning of the Wider Caribbean ecosystems

Jamaica s National Parks and Protected Areas are established under the Natural Resources Conservation Authority (NRCA) Act In addition a number of other legal instruments can influence the management of the Black River Protected Area Chief among these are the additional acts implemented by the NRCA (Beach Control Watershed Protection and Wild Life Protection) and acts that provide the mandate for the Jamaica National Heritage Trust (JNHT) the Fisheries Division the Port Authority the Land Development and Utilisation Commission the Town and Country Planning Authority and the Urban Development Corporation (UDC) (see Table 3 1) For further detail and recommendations for action see Chapter 5 Sub-Programme 6

Revisions being prepared to the NRCA Watershed Protection Fisheries Industry and JNHT Acts will widen the legislative framework and provide further support for future management efforts in the proposed Black River Managed Resource Protected Area

Regulations The declaration of protected areas must be accompanied by regulations that provide the legal framework for their establishment and operation Regulations are in place for the existing national and marine parks under the NRCA Act The NRCA is preparing drafting instructions for regulations for the additional types including Managed Resource Protected Areas

Policies The basic policies for establishment and management of a system of national parks and protected areas are expressed in the White Paper previously referred to Additional policies are in process of review--Towards a Beach Policy (Green Paper) or preparation--Towards a Watershed Policy for Jamaica (draft Green Paper)

Draft policies related to mangroves and wetlands seagrasses coral reefs as well as policy guidelines related to mariculture marina and small craft harbours coastal dredging underwater pipelines and cables and deployment of benthic structures have been prepared A number of these have received broad review and while not formally adopted Government policy should be regarded as sound expressions of acceptable practices

Table 3.1 Black River Managed Resource Protected Area - General Legislative Framework	
CONVENTION/LEGISLATION/POLICY/REGULATION	**APPLICATION/PROTECTED AREA FOCUS**
International Conventions	Biodiversity Wetlands Specially Protected Areas Threatened Species
NRCA Act	Protected Area Establishment Management and Regulations
Beach Control Act	Beaches Encroachment on Foreshore or Floor of the Sea
Wild Life Protection Act	General Species Management Protected Species
Watershed Protection Act	Erosion reduction Improvement in Quality of Water reaching Protected Area
Town and Country Planning Act	General Development Control, Development Plans and Orders Tree Preservation Orders
Local Improvement Act	Sub division Plan Requirements
Land Development and Utilisation Act	Regulation of Idle Lands Terms of Leasing and Disposition of lands
Urban Development Act	Establishes UDC s Jurisdiction as Sole Planning Authority within Designated Areas
Fisheries Industry Act	Issuing of Licences Fisheries Regulations Designation of Fish Sanctuaries
Public Health Act	Standards for Potable Water Monitoring of Microbiological Quality
Litter Act	Littering in Public and Private Places
Quarries Control Act	Sand Mining
Pesticides Act	Regulation of Use of Agricultural Chemicals in Areas Adjacent to Coastal Areas/Rivers

Protected Area Guidelines A series of policies exist to assist the NRCA and local management organizations with a number of practical aspects of protected area management These are designed to make the official Protected Areas Policy more operational and to achieve a minimum level of consistency throughout the protected areas system However because of the variation among the components of the system they stop short of what is needed to guide the management of a specific protected area The latter is the purpose of this draft Management Plan

In addition to the Guidelines for Management and Operations Plan preparation referred to in Chapter 1, the draft guidelines address Biodiversity Protection Compliance, Delegation Development on Private Lands Emergency Preparedness and Response Financing Fire Management Human Resources Infrastructure Integrated Pest Management Land Acquisition, Local Advisory Committees Management and Operations Plan Development Monitoring and Evaluation Natural Disasters, Public Health and Safety Public Involvement Research Signs Markers and Buoys, Special Uses and Products Tourism, and Waste Management

Enforcement Key to effective resource management in the context

of extensive legislation and policy is improved enforcement An advantage of the proposed protected area will be resources available for additional patrols and a greater understanding of the need for and commitment to enforcement of existing laws

3 2 Natural Resources

The upper and lower basins of the Black River Parottee and Luana/Font Hill form the largest alluvial and peat wetlands in Jamaica They are framed by limestone hills with many caves and rich fossil deposits Along the coast there are sandy beaches some of the most extensive sand dunes in the country rocky cliffs mangroves seagrass beds and coral reefs (see draft EPF Figure 12) The coastal shelf is narrow near Scott s Cove but widens rapidly to the south

The 70km Black River system is the longest in Jamaica Its sources lie in limestone aquifers and surface water flows originating in the Cockpit Country The delicate water balance in the Black River system is maintained by a combination of springs and blue holes, surface runoff and rainfall Rainfall in the parish decreases from west to east and from north to south so the climate along the south coast and the Pedro Plains is very dry with less than 1 3 m (50 in) of rainfall As a result of withdrawal of groundwater from wells most coastal aquifers are already affected by saline intrusion Pressures for withdrawal of even small quantities of Black River water for irrigation of the plains could impact the hydrologic and ecological regimes of the Black River Morass and its biodiversity

In the Upper Morass the soils are mainly alluvial while in the Lower Morass most of the soil is peat The soils of the wetlands though deep are not generally suitable for intensive large-scale agriculture The limestone islands have productive soils and have deposits of clay and sand as well as limestone The soils of the limestone hills and coastal plains are generally poor and best suited for pasture and tree crops Extensive areas are in land use capability class VI unsuitable for any kind of disturbance (see EPF Figure 10)

Important mineral reserves include silica sand clay limestone, whiting and peat There has been considerable interest in mining peat for fuel and horticultural purposes but the many studies of the area have all concurred that the value of the morass in its natural state outweighs the possible benefits of mining Legal and illegal mining of sand has damaged the visual quality of several areas and threatens to alter some unique ecosystems

The proposed protected area contains extraordinary biological diversity with a high percentage of native and endemic species This biodiversity is best understood and therefore managed and conserved in terms of

the three principal ecosystems marine/coastal freshwater wetland and forested hills (Section 3 2 1)
species (Section 3 2 2) and
existing and potential uses of renewable and non-renewable natural resources (Section 3 2 3)

3 2 1 Ecosystems

- **Marine, Saline and Coastal Ecosystems (including Wetlands)** All the main types of marine ecosystem are represented in the proposed Black River Managed Resource Protected Area Marine resources are abundant and important to the local economy However the marine systems have not been well studied and little is known of their current status and conservation needs (See Table 3 2)

- **Freshwater Ecosystems (including Wetlands)** Very little is known of the freshwater ecosystems of Jamaica in general or of Black River in particular Freshwater wetlands are uncommon and the best examples will be represented in the proposed Managed Resource Protected Area Many areas (for example the Black River Upper Morass) have never been studied but some of the rarest freshwater plant species are only known from this area (See Table 3 3)

- **Forested Hills** Only small areas of forested hills are included in the proposed Protected Area (See Table 3 4)

Table 3 2 Marine, Saline and Coastal Ecosystems

TYPE	DESCRIPTION	DISTRIBUTION JAMAICA	DISTRIBUTION IN ST ELIZABETH
Beaches	Many beaches are formed of coral or algal derived white sand with mangroves or strand woodland behind West of Black River beaches tend to be muddy **Species** nesting sea turtles crocodiles **Stresses** sand mining coastal development beach erosion sediment deposition	Islandwide	White sand Parottee Crane Beach east of Black River Grey sand Treasure Beach White sand and mud West of Black River (especially Chocolata Bay)
Rocky shores and cliffs	Very little is known of the ecology of the rocky coastlines **Species** To be determined **Stresses** Development	Widespread	Along coast between Lover s Leap and Great Pedro Bay Billy s Bay west of Luana Point
Sand dunes	Vegetation dominated by introduced species (e g guango limes and logwood) with a few indigenous trees such as sweetsop and lignum vitae Further study needed to identify areas in natural condition **Species** rare plants could occur **Stresses** seriously disturbed through grazing and sand mining **Stresses** mining coastal development grazing introduced species	Uncommon (mostly Hellshire)	Great Pedro Bay Hodges Thatchfield
Tidal mud flats	Highly productive muddy areas Rare geological features at Luana **Species** very important for shellfish and shorebirds **Stresses** pollution erosion trampling	Uncommon	Luana/Font Hill
Seagrass beds	Extensive beds of seagrasses (*Thalassia testudinium, Synngodium sp*.) Seagrass beds are usually important as fish nurseries **Stresses** Sediment deposition potential clearing for on recreational beaches Seagrass beds should be conserved	Widespread along south coast	Well developed off Alligator Pond Great Pedro Bay Luana Font Hill
Coral reefs	Locally tend to be small patchy and affected by sediment Not well studied **Species** Fish invertebrates **Stresses** Sediment deposition nitrate enrichment over fishing dynamite	More abundant on North coast coast than South coast	Many smaller patch and fringe reefs along coastline
Mud	Muddy areas of the seabed along coastline are of great importance for some commercial species of shrimp and fish **Species** shrimp fish worms **Stresses** Pollution	More abundant on South coast than North coast	Black River west
Coastal/strand woodland and strand dune associes	Generally behind sandy beaches often with lots of Seagrape Buttonwood and Seaside Mahoe Yellow Nicker Stabilizes the sand of the berm and protects land behind from wave action Stresses Coastal development timber extraction sand mining	Formerly widespread increasingly rare	Remnants found at Malcolm Bay Luana/Font Hill Parottee Treasure Beach
Coastal lagoons saline and brackish ponds	Important habitat for wildlife Some potential for eco tourism **Species** Ducks shorebirds crocodiles rare plants **Stresses** Drought sedimentation reclamation for housing and commerce pollution, loss of connections to sea	Uncommon	Ponds at Parottee Font Hill and Great Pedro Pond are of outstanding national importance

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Table 3 2 Marine, Saline and Coastal Ecosystems

TYPE	DESCRIPTION	DISTRIBUTION JAMAICA	DISTRIBUTION IN ST ELIZABETH
Mangroves	Multiple functions include nursery for marine and estuarine species fish habitat bird habitat nutrient filtering beach and riverbank stabilisation control of saline intrusion storm and global warming protection **Species** Red white black and buttonwood **Stresses** Illegal and unsustainable methods of harvesting for poles (red and black) charcoal and fishpots clearing for development grazing burning dumping dove hunting fishing with nets hurricanes	Except for Martha Brae Estuary plentiful mainly on the south coast	Red plentiful along Broad River and in Parottee Font Hill Malcolm Bay and exposed coastal areas White scattered among red where salinity low Black plentiful where salinity high– at Luana and Parottee Ponds Button in drier sandy areas and on rocks

Table 3 3 Freshwater Ecosystems

TYPE	DESCRIPTION	DISTRIBUTION JAMAICA	DISTRIBUTION ST ELIZABETH
Riverine forests	A special landscape **Species** *Lonchocarpus* sp and *Crudia spicata* have become very rare Logwood guango and sweetwood are common **Stresses** agriculture charcoal burning timber extraction	Once widespread now rare and badly degraded	Riverine forests were charactenstic of the upper reaches of the Black River above the Holland pumping station includes some of best examples of this habitat
Rivers and streams Blue holes Springs	Longest river system in Jamaica These plants are important habitat for shrimp and birds **Species** Endemic fish juvenile fish and shrimp birds crocodiles rare plants **Stresses** Tourist boat traffic pollution abstraction of water	No comparable system	
Large permanent ponds	Wallywash Its ecology has never been studied **Species** West Indian Whistling Duck **Stresses** hunting	The largest in Jamaica	None
Herbaceous wetlands	Herbaceous wetlands Areas with reeds or shallow water channels and short vegetation are most important for wildlife **Species** Uncommon plants **Stresses** Fire grazing agriculture	Uncommon	Dominates Black River Upper and Lower Morasses Small areas ponds at Font Hill and Hodges Wallywash Thatchfield Lacovia
Swamp forests	Species rich woodlands A special feature of the lower morass **Species** Hardwoods **Stresses** selective extraction of timber fire and hurricanes	Very rare Other wise found only at Paradise and Negril	Small remnant s a Punches Front mans Middle Quarters and Baptist Presence of Royal Palms suggests previous occurrence in upper morass
Seasonally flooded pasture	E g savannas grazed by cows during drier periods and managed pastures **Species** ? **Stresses** ?	Restricted	Mostly lower morass
Seasonal gullies	In the hills around the swamp and along the dry coasts Upper reaches often characterized by larger than normal trees (where these have not been felled) **Species** Hardwoods **Stresses** Timber extraction	Common	

Limestone islands	Isolated patches of hard land surrounded by swamps are **Species** hardwoods (including mahogany and bullthatch) **Stresses** Timber extraction fire agriculture	Negril	Slipe Cataboo and Frenchmans upper morass

Table 3 4 Forested Hills

TYPE	DESCRIPTION	DISTRIBUTION JAMAICA	DISTRIBUTION ST ELIZABETH
Dry limestone forest and woodland	Dominated by drought tolerant species of trees and shrubs cacti vines and palms Lignum vitae (*Guiacum officinale*) which was once common in this habitat is now rare Logwood is common Most of the larger timber trees have been extracted but there are occasional large examples of silk cotton and breadnut (*Brosimum alicastrum*) Good habitat for gamebirds (columbids)	Widespread in dry lowlands	Coastal and interior ranges of hills Yardley Chase Pedro Bluff Thatchfield Fort Charles (Middle Quarters hills)
Savannas	Various man induced savannas occur around parish including Seymour Grass Lignum Vitae savanna (typical of Treasure Beach) Thatch palm savanna (east of Pedro Bluff) and guango savanna (Font Hill)	No similar areas can be found in other parts of Jamaica	Treasure Beach west of Pedro Bluff and Font Hill
Pedro Plains	A patchwork of small cultivation and residences	No similar areas can be found in other parts of Jamaica	Pedro Plains

3 2 2 Species

Complete numbers of species are not available for the entire proposed Protected Area However the Black River Morass alone provides habitat for 207 species of flora of which 11 are endemic and 22 are rare The rare plants include night-blooming waterlilies and other attractive species such as the Royal Palm and the Alligator Pear - closely related to the Brazil Nut Sites of special biological importance include the remnant swamp forests of the eastern and western Lower Morass Plants of economic importance include the Bullthatch used in basketry The biodiversity is also important for medicinals and other practical applications

Several species of global concern in the Black River Morass and the Black River Bay include American Crocodiles West Indian Manatees Hawksbill Turtles and West Indian Whistling Ducks Of the 197 species of birds 15 are endemic species 14 are endemic sub-species and 52 are winter migrants Thirty percent of total species notably including the West Indian Whistling Duck Black Crake and Spotted Rail are rare Of the 20 species of amphibians and reptiles 50% are endemic and 10% rare The saline gradients in the Black River estuary, together with the habitats of the morass and the bay form the basis for an economically important fishery based on fish and shrimp

The following table (3 5) provides a listing of threatened and protected plants in the lower morass and adjacent coast

Table 3 5 Some Threatened and Protected Plants of the proposed Protected Area

GROUP	COMMON NAME	SCIENTIFIC NAME	STATUS	DIST GLOBAL	DIST JA	CITES (incomplete)	SPAW	WLPA
Cactaceae	Cacti	All species except those in Annex I	?		Mostly endemic	II		
Combretaceae	Buttonwood	*Conocarpus erectus*	?	Tropical Atlantic	Mostly s coast		III	
Combretaceae	White Mangrove	*Laguncularia racemosa*	?	Tropical Atlantic	Mostly s coast		III	
Cymodoceaceae		*Halodule wrightii (ciliata/bermudensis/beaudetti)*		Central America and W Indies	?		III	
Cymodoceaceae	Manatee Grass	*Syringodium filiforme*	?	W Indies and Southern USA	?		III	
Euphorbiaceae	Euphorbias	All non succulents	?	Mostly tropics	Some endemics			
Hydro-charitaceae	Turtle Grass	*Thalassia testudinium*	Declining?	W Indies Bahamas Bermuda	Mostly s coast		III	
Hydro-charitaceae		*Halophila decipiens*	?	Pan-tropical	?		III	
Liliaceae	Sinkle Bible	*Aloe vera*	?	Native of Mediterranean widely cultivated	?	II		
Orchidaceae	Orchids	All species	Declining?		Many endemics	II		
Meliaceae	Bigleaf (Honduras) Mahogany	*Swietenia macrophylla*	Declining?	Cl America	Introduced	III		
Meliaceae	West Indian Mahogany	*Swietenia microphylla*	Commercially extinct	W Indies C/S America	Forests	?		

Rhizophoraceae	Red Mangrove	*Rhizophora mangle*	Declining?	Coasts of C America and W Indies	Coastal wetlands mainly S coast		III	
Ruppiaceae		*Ruppia maritima*	?	Cosmopolitan	?		III	
Verbenaceae	Black Mangrove	*Avicennia germinans*	?	American sub-tropics and W Africa	Coastal wetlands mainly s coast		III	
Zygophyllaceae	Lignum Vitae	*Guaiacum officinale*	Declining?	C America and W Indies	Coastal plains		III	

Table 3 6 Some Threatened and Protected Animals, Endemic Species and Species of Special Concern in the proposed Protected Area

GROUP	COMMON NAME	SCIENTIFIC NAME	STATUS	DIST GLOBAL	DIST JA	CITES (incomplete)	SPAW	WLPA
INVERTEBRATES								
Milleporidae	Corals	All species	Declining	Pan tropical	Coral reefs		III	
Stylasteridae	Corals	All species	Declining	Pan tropical	Coral reefs		III	
Antipatharia	Corals	All species	Declining	Pan tropical	Coral reefs		III	
Gorgoniacea	Corals	All species	Declining	Pan tropical	Coral reefs		III	
Scleractinia	Corals	All species	Declining	Pan tropical	Coral reefs		III	
Mollusca	Conch	*Strombus gigas*	Declining		*Sea grass* beds	II	III	
Crustacea	Lobster	*Palinurus argus*	Declining		Coral reefs		III	
FISH								
	Snook	*Centropomus undecimalis*	Keystone species		Rivers and sea			
Megalopidae	Tarpon	*Megalops atlanticus*	Keystone species		Rivers and sea			
Poecilidae	St Elizabeth Top Minnow	*Cubanichthys pengellyi*	?	N/a	Endemic restricted to Black River system			
Poecilidae	Mosquito Fish	*Gambusia wrayi*	?	N/a	Endemic *species*			
	Black-bellied Limia	*Limia melanogaster*	?	N/a	Endemic genus			
REPTILES	Hawksbill Turtle	*Eretmochelys imbricata*	Declining	Pan tropical	Islandwide		II	
	Loggerhead Turtle	*Caretta caretta*	Declining	Widespread	Islandwide		II	
	Green Turtle	*Chelonia mydas*	Declining	Widespread	Islandwide		II	

	Jamaican Slider	*Pseudemys terrapen*	Declining	N/a	Endemic			
	American Crocodile	*Crocodylus acutus*	Declining	Central America	Mostly s coast		II	
BIRDS								
Anatidae	West Indian Whistling Duck	*Dendrocygna arborea*	Declining	W Indies	Mostly Black River		III	
Charadriiformes	Least Tern	*Sterna antillarum*	Declining?	Americas	Mostly s coast		II	
Charadriiformes	Roseate Tern	*Sterna dougallii*	Declining	Pan tropical	Mostly s coast		II	
Falconidae	Peregrine Falcon	*Falco peregrinus*	?	Global	Mostly coastal		II	
Pelecanidae	Brown Pelican	*Pelicanus occidentalis*	?	C and S Americas W Indies	Mostly coastal		II	
Phoenicopteridae	Flamingo	*Phoenicopterus ruber*	?	W Indies	V rare visitor		III	
MAMMALS								
Sirenia	West Indian Manatee	*Trichechus manatus*	Declining <50 in Jamaica	W Indies Fla C America	Mostly s coast		II	

3 2 3 Resource Uses

Wetlands are among the most useful and productive of all natural ecosystems The existing and potential uses of the resources of the wetlands and coastal areas of the proposed Managed Resource Protected Area are summarized in Tables 3 6 and 3 7 (reproduced from the draft EPF

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Table 3 7 Goods, Services and Attributes Derived (actually or potentially) from the Wetlands		
	SOURCE	PRODUCT
GOODS	1 Mineral resources	E g salt – Not currently used Clay?
	2 Energy resources (biomass)	Peat – Not currently used (fuelwood experiment)
	3 Water supply	Wallywash Luana Appleton
	4 Forest resources fuel	Wood fuel for cooking Charcoal for cooking
	5 Forest resources timber sticks and bark	Roundwood for chicken houses and house frames Scantlings for house walls and nog Fence posts Scaffold poles Fish pot construction Bark for leather dyes and floor polish (not currently used)
	6 Agricultural resources (food fibre aquaculture)	Fish ponds in upper morass
	7 Forage resources	Grazing for goats and cattle
	8 Fishery resources	Finfish Crustacea (shrimp crayfish crabs lobsters) Molluscs (oysters) Turtles Manatees
	9 Wildlife resources	Subsistence hunting Columbids Waterbirds Turtles Sport hunting Columbids Recreation/tourism American Crocodiles Turtles (potential)
	10 Miscellaneous resources	Dyes not currently used Craft materials thatch
SERVICES	Water supply	Groundwater recharge Groundwater discharge
	Coastal protection and water quality maintenance	Flood and flow alteration (storage and desynchronisation) Sediment/shoreline stabilization/erosion control/shoreline protection Sediment/Toxicant retention Nutrient removal/retention/transformation Production export (nutrients) and support to neighbouring ecosystems (e g coral reefs)
	Habitat	Fish and shellfish habitat (including nurseries) Wildlife habitat (including shorebirds and other migrants) Endangered species habitat (West Indian Whistling Duck American Crocodile West Indian Manatee rare plants)
ATTRIBUTES	1 Biological diversity	Black River Lower and Upper Morasses Luana Font Hill Parottee Pedro Ponds specially small ponds reed beds and swamp forests
	2 Visual quality/ aesthetics/landscape value	Especially Broad River
	3 Education/scientific value	Not currently used
	4 Recreational value	Lower Black River beaches cays
	5 Uniqueness/heritage value	Swamp forests

Table 3.8 Goods, Services and Attributes Derived from the Coral Reefs, Beaches and Coastal Woodlands		
FUNCTION	**SOURCE**	**PRODUCT**
GOODS	1 Mineral resources	Silica and carbonate sand titanium antimony
	3 Water supply	Springs
	4 Forest resources fuel	Wood fuel for cooking Charcoal for cooking
	5 Forest resources timber sticks and bark	Fence posts
	6 Agricultural resources (food fibre aquaculture)	Possibilities for mariculture (irish moss oysters lobsters)
	7 Forage resources	Grazing for goats and cattle
	8 Fishery resources	Finfish Crustacea (shrimp crayfish crabs lobsters) Molluscs (oysters conch) Turtles Manatees
	9 Wildlife resources	Subsistence hunting Columbids Waterbirds Turtles Sport hunting Columbids Recreation / tourism American Crocodiles Turtles (potential)
	10 Miscellaneous resources	Dyes - not currently used Craft materials thatch
SERVICES	1 Water supply	Maintenance of barrier between seawater and swamp water
	2 Coastal protection and water quality maintenance	Berm can protect reefs from runoff Sediment/shoreline stabilization/erosion control/shoreline protection (coastal woodland seagrasses coral reefs) Sediment/Toxicant retention (seagrasses) Nutrient removal/retention/transformation (algae) Production export (nutrients) and support to neighbouring ecosystems (e g coral reefs)
	3 Habitat	Fish and shellfish habitat (including nurseries) Wildlife habitat (including shorebirds and other migrants) Endangered species habitat (American Crocodile West Indian Manatee rare plants)
	4 Mooring areas for boats	
ATTRIBUTES	1 Biological diversity	Coral reefs
	2 Visual quality/ aesthetics/landscape value	Beaches coral reefs coastal dune systems
	3 Education/scientific value	Specially Treasure Beach Parottee Pedro Ponds
	4 Recreational value	Beaches swimming paddling and picnics Diving snorkeling and glass bottom boats coral reefs (Especially Alligator Reef reefs off Luana/Font Hill and Parottee Point) Recreational fishing Coastal boat trips Jet skis speed boats and water skiing
	5 Uniqueness/heritage value	Coastal dunes

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3 3 Human and Cultural Resources and Settlements

3 3 1 Population

The proposed MRPA is sparsely populated the number of residents being estimated based on the 1991 Census at between 7 000 and 8 000 Patterns of settlement in the proposed MRPA vary widely among and in some cases within sub-areas However in virtually every case, communities are in some way dependent on the natural resources of the surrounding area

The principal settlements are Black River Lacovia and Treasure Beach Each of these at different scales has a market and service function Black River is the seat of local government and business services with a river tourism business Treasure Beach has a strong ocean fishing and tourism function

Outside the major settlements a large number of small villages along the coast on limestone islands in the Lower Morass and around the edges of the Upper and Lower Morass are closely linked with the coastal and wetland resources Illegal development occurs along the coast and in the more accessible parts of the Lower Morass Provision is being made for the relocation of squatters at Operation PRIDE settlements in the Luana/Font Hill area and at Vineyard

3 3 2 Resource Uses and Economic Activities

The Black River Morass and the associated coastal areas support a number of traditional resource-based lifestyles (summarized in Section 3 2 3) as well as larger-scale farming fisheries mining tourism and commercial activities

Agriculture in the Lower Morass consists mostly of dasheen banana cassava and ganja on raised dykes The fertile alluvial soils on the limestone islands and around the morasses support mixed agriculture food forests sugar cane (and previously rice) The marginal lands around morasses are used for grazing Indian cattle and goats

Fishing in the Lower Morass occurs mainly by day with hook and line and shrimp and crab pots and by night (illegally) with gill nets Fishing in the Upper Morass is mostly by hook and line and fish pots There is a large fish farm in Upper Morass owned and operated by Jamaica Broilers and two smaller operations Deep sea fishing operates from Treasure Beach and other several other beaches (Great Bay Calabash Bay Frenchman s Bay Billy s Bay Fort Charles Parottee Galleon Black River and Hodges

Mining The principal legal exploitation of minerals occurs at Hodges where silica sand is the basis for glass making Some mining of sand and clay occurs on western margins of lower morass and at Thatchfield Illegal mining of sand is a problem on the coast and berm at Parottee Illegal beach and dune sand mining is also a significant concern in the Crawford area

Industry Industrial activities are few and include glass making at Hodges brick and tile making, crab and fish packing and pimento processing

Tourism Over the last 10 years boat tours on the Lower Morass have become a thriving industry There are 3 large operators and many small ones, with unlicenced fishers carrying tourists from as far away as Treasure Beach There are several hotels guest houses and villas in Black River along the Crane Road-Parottee strip and in Treasure Beach

Research The proposed Managed Resource Protected Area has extraordinary value for education and scientific research There is an urgent need for baseline and monitoring studies and for research into habitat restoration more sustainable approaches to resource use traditional uses of resources and potential new uses for endemic and rare plants and other species However the area has received very limited research attention The Lower Morass was studied to some degree in association with peat extraction proposal in the 1980 s while the Upper Morass remains largely unstudied

3 3 3 Traditional Resource User Communities

Primary among those who derive some or all or their livelihood from the swamp are fishers shrimpers thatch collectors, farmers who farm in or graze cattle in the swamp sawmill operators tour boat operators and their employees Secondary users include shrimp and fish vendors craft producers and vendors, etc

A 1995 study identified several types of livelihood strategies among residents of hamlets within and around the Black River Lower Morass such as Middle Quarters Cataboo Slipe Frenchman s and Vineyard [1] The findings are summarized in Annex F of the draft EPF The following table (3 8) identifies these and other approaches to livelihood throughout the proposed MRPA

1 Anita Spring Project on Human Activities and Environmental Contaminants of the Lower Black River Morass North South Center Miami December 1995

Table 3 9 Sources of Livelihood by Sub-area

SUB-AREA	PRIMARY SOURCES OF LIVELIHOOD	SETTLEMENT TYPE
Black River Town	Trade and services Tourist accommodation Ecopreneurs and entrepreneurs	*Compact town at port/river crossing*
Black River Lower Morass ▪ **Central limestone Islands** ▪ **South Morass (Vineyard)** ▪ **East of Morass**	Fishing with subsistence agriculture (crops and/or cattle) with or without higgling and with/without crafts Deep sea fishing with Morass fishing and agriculture (crops and /or cattle) Mixed agriculture (crops and/or cattle) and fishing with or without higgling Crafts subsistence agriculture with/without shrimp fishing and/or higgling Agriculture (crops and/or cattle)	*Small linear settlements on limestone islands* along Slipe road from Black River to Lacovia with side roads extending towards Black River at Cataboo and Frenchmans East of Morass (Burnt Ground Burnt Savanna) South of Morass Vineyard
Black River Upper Morass	Large scale agricultural crops (sugar cane) and pasture Mixed agriculture (Braes River)	No settlements within proposed boundaries
Middle Quarters/ Bamboo Avenue/Lacovia	Small agriculture – crops and cattle Large agriculture - sugar Shrimp higgling *Vending on Bamboo Avenue*	Corridor connecting linear settlements
Luana/Font Hill	Agriculture (crops and/or cattle) with some fishing Deep sea fishing with Morass fishing	Informal settlers at Font Hill being relocated to Operation PRIDE Luana Long established informal settlement at Crawford
Parottee	Deep sea fishing with Morass fishing and agriculture (crops and /or cattle)	Fishing (Parottee Beach) and farming hamlets (Parottee Hill Top)
Treasure Beach/Lovers Leap	Deep sea fishing with Morass fishing Agriculture (crops and/or cattle) Ecopreneurs and entrepreneurs	

3 3 4 Cultural Resources

As described in the draft EPF St Elizabeth is a repository of historic resources ranging from the town of Black River which is being designated a National Heritage site by the Jamaica National Heritage Trust (JNHT) to numerous prehistoric sites great houses and unique reminders of a long and interesting history It also prides itself on its unique culture and tradition of self reliance

3 3 5 Skills and Leadership Capacity

St Elizabeth does not yet have a widely-developed leadership infrastructure in environmental management Public meetings leading to the drafting of the EPF demonstrated a high level of interest in being involved in decision making They also showed the need for intensive efforts to get out word of meetings and help with transportation in more remote areas

The St Elizabeth Environmental Expo held in Santa Cruz in June 1997 which included the broadcast of "Tuesday Forum' and several focus group meetings demonstrated the potential depth of leadership and the realism of developing a network of community and resource user groups Training in organizational skills and much wider and more frequent dissemination of environmental information will be required however

3 3 6 Level of Environmental Awareness

The survey of environmental awareness carried out in the parish in late 1996 showed that St Elizabeth residents have a limited or inconsistent level of understanding of the workings of the environment A summary of findings can be found in Annex B of the draft EPF

3 4 Inappropriate, Harmful and Unauthorized Uses

Damaging and potentially damaging practices are laid out in detail in the draft EPF since they apply throughout the parish and require a parish-wide effort for full solution In summary they include abuse and uncontrolled exploitation of renewable natural resources including water and thoughtless or illegal use of non-renewable resources including land It should be understood however that when dealing with threatened and endangered ecosystems habitats and species these theoretically renewable resources become non-renewable when a certain threshold is passed

3 4 1 Non-renewable Resource Use

Mining and Quarrying The legal mining of silica sands from the Hodges dunes has had significant impacts on the dune ecosystems and drainage regimes as well as on the aesthetics of the area Illegal mining of sand is carried on at Crawford and elsewhere

Land Use There is not yet an understanding throughout the proposed protected area of the need to ensure careful land use While the Pedro Plains has developed a unique balance of residences and small farms elsewhere the fragility of the natural environment calls for maintenance of a strong and clear distinction between urban settlements and natural and agricultural areas

- Houses have been and continue to be built without permits in the Black River Lower Morass where the density of settlements without sewers and sewage treatment threatens to affect public health and where the intensity of use and conflicts with natural conditions threaten the health of the morass
- Subdivisions have been approved in areas unsuited for residential development
- Pressure for expansion of Black River is overlooking the opportunities and desirability of infill of the existing fabric

These symptoms reflect the lack of

- a comprehensive understanding of the importance of the elements of the key ecosystems and their needs and uses,
- a realistic recognition of the finite nature of space in Jamaica and in its most valuable natural regions and
- a demand for effective and cost-effective urban infrastructure

3 4 2 Renewable Resources

Fishing Traditional methods of ensuring the sustainability of the shrimp fishery in the Lower Morass are being overlooked by young

fishermen This is exacerbating the problems of the fishery caused by the dunder pollution of the river

Illegal Harvesting of Threatened Species The slaughter of turtles and crocodiles is reported with some regularity

Farming The setting of fires and the damage caused by grazing are the principal problems associated with agriculture in and around the Morass Drainage of the morass to create new pasture is also reported

Logging Illegal removal of trees from stands of forest in the Lower Morass and unsustainable harvesting of mangroves in coastal areas are practices that appear to be increasing

Craft Materials Over-harvesting of thatch palm and destruction by cattle have resulted in a shortage of this traditional craft material

Inadequately Controlled Tourism The uncontrolled expansion of boat operations on the river has led (predictably) to environmental and social problems A recent carrying capacity" study failed to address the issues

Water Use The greatest existing threat to the water resources of the Black River system comes from the dunder releases from the Appleton Rum Distillery Appleton was identified as the source of much of the river's pollution as long ago as 1972 [1] However no action has yet been taken by or against the company

The greatest potential threat lies in the continuing demand for irrigation of the Pedro Plains, a demand that increases in periods of drought There have been many proposals to use water from the Black River at or above Lacovia and Wallywash for this purpose Construction of a canal at Lacovia was started in the 1980s However the water demand would be very great and probably could not be fully supplied from wells and surface run-off in the plains Most plans have suggested taking water from the Black River

Abstraction of water from the Black River would reduce flows in the river specially in times of drought There would be a risk of increased saline intrusion into the groundwater

The following table taken from the draft EPF provides a comprehensive summary of the use and misuse of this most critical element of the proposed Managed Resource Protected Area

3 4 3 Other Inappropriate Practices

The draft EPF provides extensive coverage of the following additional problems that must be addressed within the proposed protected area

- Solid wastes,
- Burning and air pollution
- Noise pollution
- Replacement of indigenous houses with distinctive styles with modern concrete structures

3 4 4 Relationship between the Protected Area Quality and the Surrounding Hills

Finally it must be reiterated that deforestation in the hills around the morasses is probably increasing the frequency and severity of flash flooding in the communities around the morasses Silt in the runoff may be tending to fill in some areas of the swamps, changing their function and further reducing their ability to absorb and retain flood waters Conservation of the wetland and coastal ecosystems must be planned and implemented in the context of conservation of the surrounding hills

[1] Basil Fernandez The Daily Observer March 13 1999

4 BLACK RIVER MRPA MISSION, VISION AND GOALS

4 1 Protected Area Mission

The proposed Black River Managed Resource Protected Area is a principal tool for implementing the draft Environmental Policy Framework for St Elizabeth The Protected Area therefore takes its mission from the following vision for an environmentally-sustainable parish expressed in the draft EPF (p121)

- Improve the standard of living of people of St Elizabeth and indirectly of all Jamaicans through promotion of wise use of natural resources in economic activities including nature and community tourism, agriculture, light industry, crafts, communications etc and the development of strategies to ensure compatible rather than competing activities,
- Encourage the wisest, most sustainable use of natural resources (e g fish, shrimp, crabs, craft materials, timber, game birds, herbal medicines soils surface and groundwater waterways etc), the halting of deforestation and solving of point source pollution, etc ,
- Maximize and conserve natural functions of environment (groundwater recharge, coastal protection, erosion control, climate control),
- Ensure the survival of representative examples of natural ecosystems (particularly those better represented in St Elizabeth than rest of Jamaica, e g swamp forest, riverine forest, herbaceous marshes sand dunes),
- Ensure survival of rare and endemic species, particularly those whose populations in St Elizabeth are of national or international significance (e g crocodile, manatee, West Indian Whistling Duck (WIWD) rare plants)
- Ensure conservation of best examples of man-altered landscapes of natural beauty or ecological value (e g lignum vitae guango and palm savannas, dryland farming),
- Ensure the conservation of nationally and locally important cultural sites, monuments and structures (e g. Black River town),
- Through effective planning, discourage creeping destruction of landscapes, coastal resources, watersheds and natural beauty

It cannot be stressed too strongly that the drafting of this chapter has assumed prior public review of the St Elizabeth EPF That review is essential before the present document can be put into its final form The protected area is essential to realising the parish-wide vision but commitment to and effective implementation of the EPF are equally fundamental to success of the protected area

- The economy of the communities of Black River and environs is more explicitly linked to the natural environment than most others in Jamaica Economic development of the area and the survival of the coastal ecosystems and fisheries depend on the maintenance of the ecological quality of the wetlands, which depend on the conservation of the forests of the watersheds in the surrounding hills and Cockpit Country
- Effective conservation of the Black River Morass requires an integrated approach involving the central areas (Black River Lower and Upper Morasses Parottee and Font Hill), associated coastal areas and the parallel development of a protected area in the Cockpit Country linked to the Black River Lower Morass National Park through a corridor including the YS Valley

4 2 Protected Area Vision and Desired Outcomes

The draft EPF (pp 28 and 30) states that the proposed Managed Resource Protected Area will 'ensure orderly sustainable development of wetland and coastal St Elizabeth ensuring maximum benefit for the population while maintaining and enhancing the environment according to a vision to be developed by the people of the area in cooperation with national agencies

This chapter presents a vision for the proposed Black River Managed Resource Protected Area and its major sub-programmes including administration protection and conservation recreation and tourism education and public relations legislation and enforcement and research and monitoring From these visions are constructed management strategies and action plans a zoning map and outline plans for sub-areas (including project ideas) ecosystems and species

Management (Administration) Vision

The Managed Resource Protected Area will be
- self-reliant
- economically feasible in the short term
- self sustaining in the long term
- be staffed as far as possible by people from the immediate area
- build and strengthen relationships with the NRCA other NGOs and community groups
- build a strong sense of local ownership of the river system,
- achieve tangible results in priority projects throughout the protected area and
- command the respect of and achieves the cooperation of public and private interests in combating environmental problems

Socioeconomic Vision

The Managed Resource Protected Area will
- involve local communities in decision-making re local planning and development and design and implementation of conservation programmes
- provide a mechanism for coordination and harmonization of conservation and development strategies in southern St Elizabeth and provide guidance for stake holders
- ensure that development and conservation initiatives proceed together and do not exceed the carrying capacity of the area or resources
- increase awareness of the importance of natural resources and the options for their sustainable management and develop advocacy for sustainable development in southern St Elizabeth
- increase the contribution of natural resources (e g fish and shrimp timber nature based tourism) to the local economy
- promote southern St Elizabeth as a national treasury of sustainable development and improve the quality of life of its residents

Biological (Protection and Conservation Vision

The Managed Resource Protected Area will
- increase awareness of and pride in St Elizabeth s natural resources
- conserve and restore rare endangered and economically or ecologically important species and ecosystems specially those which are characteristic of southern St Elizabeth or of national or global significance
- conserve critical ecological processes
- reduce environmental degradation resulting from past present and future destructive practices (including pollution deforestation mining without effective rehabilitation)

Tourism and Recreation Vision

The Managed Resource Protected Area will
- promote public use enjoyment and economic contribution of the natural and cultural resources while protecting threatened species ecosystems and natural processes
- insuring that traditional uses are respected
- insuring that diverse recreational activities are public available affordable and reasonably convenient
- protecting and enhancing scenic quality for the benefit of residents and tourists alike
- ensure that revenues from tourism circulate in the community as much as possible
- mass tourism activities in natural areas contribute to the conservation of their surroundings
- increase the contribution of the Black River area in its natural state to the local and national economy through sustainable use of selected natural resources
- encourage responsible land use according to land capability assessments
- encourage relevant and appropriate scientific and historical research within the area

Public Education and Promotion Vision

The Managed Resource Protected Area will ensure that

- All elements of the society of stakeholders dependent on or otherwise concerned about the Black River Morass and related coastal region share at least a basic understanding of the special importance of the ecosystems and the benefits of and mechanisms for protecting and restoring them and that
- Visitors leave the area with at least an appreciation of its riches some accurate information and a thirst for more on the next visit

5 MANAGEMENT PROGRAMME

This chapter is the core of the draft Management Plan Its drafting has been guided by the National Policy for Jamaica s System of Protected Areas and the Guideline for Management Plan Preparation Chapters 1 through 3 set the overall context for Protected Area establishment showing that Black River unquestionably meets all the criteria for declaration as a Protected Area and specifically as a Managed Resource Protected Area The Management Programme lays out the broad framework for actions described to achieve the vision in Chapter 4

The Management Programme describes what needs to be done suggests which particular actors, partnerships or groups of stakeholders should undertake the action identifies priority locations and, in the zoning plan, the management regimes to be applied in particular sub-areas and locations

Management plans typically include a range of focussed programmes The following management sub-programmes are recommended as the minimum necessary to ensure realization of the vision for Black River

5 1 Administration and Staffing
5 2 Protection and Conservation of Natural Resources
5 3 Recreation and Tourism
5 4 Policy Legislation and Enforcement
5 5 Public Education Public Relations Promotion and Interpretation
5 6 Research, Monitoring and Evaluation

Once a management entity has been identified and has received delegation of authority to work as a partner with the NRCA in managing the area and as funding and other resources become available other programmes may be developed Administration and staffing is the top priority sub-programme laying out actions needed to achieve both declaration and the initiation of local management of the proposed Protected Area Because of the size and varied conditions in the proposed Protected Area the Management Programme is accompanied by Sub-area Plans and Ecosystem and Species Management Plans (Chapter 6)

The Management Programme with its package of sub-programmes is presented as an expression of the NRCA s desires and intentions and either in its entirety or as separate sub-programmes or sub-area plans should be regarded as a "Request for Proposals" by those interested in seeking delegation of managemnt authority or wishing to participate in local management

5-1 ADMINISTRATION AND STAFFING

5-1 1 Introduction

The Administration and Staffing Sub-programme is critical to the effective and sustainable management of the proposed Black River Managed Resource Protected Area It is the priority responsibility of the NRCA and the delegated Local Management Entity Yet in the absence of a selected or announced candidate local management entity, the action plan component of this draft sub-programme can only be regarded as preliminary

A major focus in this draft is therefore on the considerations and actions involved in reaching the point of a request for delegation The recommended action plan will require particular attention and refinement once the probable LME is identified

5-1 2 Vision

Management will achieve a Black River Managed Resource Protected Area that

- is self-reliant
- is economically feasible in the short term,
- is self sustaining in the long term,
- uses local staff to the maximum feasible extent
- builds and strengthens relationships with the NRCA, other NGOs and community groups,
- builds a strong sense of local ownership of the river system,
- achieves tangible results in priority projects throughout the protected area, and
- commands the respect of and achieves the cooperation of public and private interests in combating environmental problems

5-1 3 Existing Conditions

It is acknowledged in St Elizabeth that environmental management is still young and the cadre of leaders in the field is still small Local government has until recently focused less on remote communities than the two major towns The principal environmental management organization the St Elizabeth Environmental Protection Association (SEEPA) is now gaining strength However at present the South Coast Resort Board offers the widest representation combined with perhaps the greatest experience in the design and management of projects (See draft EPF, Section 6 2 3)

Several local organizations can offer effective assistance in specialized areas Among these are the Community Development Foundation, the Social Development Commission and the Malvern Science Resource Centre

Experience with sea fishermen shrimp fishermen shrimp higglers thatch craft workers and others the Black River Area has indicated the potential for establishing strong resource user groups Such groups can provide the context in which local leaders can emerge to expand the reach of the local protected area environmental management entity Indeed it is essential that the strength of these groups be developed – most effectively through the funding and implementation of projects for resource sustainability

The NRCA's Protected Areas Management (PAMB) Unit is severely understaffed apparently limiting the agency s capacity to fulfil its co-management role However acknowledgment of the centrality of protected areas to all functions of the NRCA and sister agencies could compensate for the staff and budget limitations

Many items on the recommended Action Plans in this draft Management Plan could be responded to by branches of the NRCA and linked government agencies under the leadership of the PAMB and LME The NRCA branches include (Pollution Control & Waste Management (PCWM), Coastal Zone Management (CZM) Watershed Protection and Management (WPM) and Public Education and Information (PEI) Sister agencies include Town Planning Department Jamaica Tourist Board (JTB) TPDCo Ministry of Water Ministry of Agriculture Fisheries Division Forestry Department and Land Utilisation and Development Commission Effective partnerships with these agencies are essential to expand local and NRCA capacity

5-1 4 Strategic Approach

The strategy will be to build a network of local participant groups throughout the protected area under the overall leadership coordination and support services of a local management entity (LME) It will also involve effective advocacy on behalf of the BRMRPA and those dependent upon it with agencies and individuals with the capacity to degrade or improve the environment

5-1 5 Functions of a Local Management Entity (LME)

Protected Area management organizations have the responsibility to

- act as environmental watch-dogs
- conduct outreach to stakeholders local communities and government and non-governmental entities whose activities have social environmental and economic impacts on protected areas
- attract manage disburse and account for funds for environmental protection/improvement projects
- solicit funding from a variety of donors
- provide resources to nurture and develop less well established organizations with similar aims
- provide a forum to respond to local environmental concerns
- monitor and disseminate information on environmental degradation parish-wide
- promote public education through workshops training and outreach programs
- collaborate with statutory bodies NGOs and CBOs
- link environmental and social initiatives by supporting environmentally sustainable livelihoods,
- offer management and oversight of projects to community groups and other small organizations,
- maintain accountable and transparent financial and operational procedures
- promote awareness of/compliance with environmental regulations and
- coordinate or carry out any other activities required to implement approved Action Plans

In the longer term the action plan(s) contained in this draft Management Plan will be refined to reflect the duties prescribed in the Protected Area regulations and the specific duties set out in the instrument by which the NRCA delegates management authority to one or more organizations The NRCA is responsible for determining and/or coordinating the roles and functions assignment of responsibilities (delegation and re-delegation), and a system of coordination and accountability of co-managers and other partners including NRCA other government agencies lead NGO Local Advisory Committee and other NGOs

An LME with fully delegated authority (which stops short of the power to formulate regulations) is responsible for

- **Institutional Management Capability** - developing
  - Organizational structure staffing and training
  - Recruitment training and deployment of volunteers and
  - Projects

- **Financial Sustainability** - design and implementation of
  - Long-term strategy
  - Fundraising mechanisms

- **Information Management System** - coordination of
  - Reporting monitoring results to the NRCA (repository of management-related data)
  - Access to and dissemination of management related data

- **Implementation Schedule** - ensuring that schedules are adhered where in the power of the LME

- **Performance Monitoring** - submission of
  - Quarterly and annual reports to NRCA on the performance of the delegated functions

- **Operational Plan** - preparation of an annual
  - Operational Plan reflecting the tasks required by the Management Plan Action Plan for the year in question (including financial implications)

5-1 6 Delegation Process

Levels of Delegation The NRCA aims to delegate authority for management of particular protected areas to properly constituted, competent and representative local organizations The delegated entity's function is to oversee the management of the Protected Area and the surrounding environment in accordance with stakeholder needs and national policy

Specific responsibilities are laid out in the instrument of delegation Delegation may be partial or full, depending upon the capacity of the local entity and/or the needs of the protected area

The following tables are taken from the NRCA s Guidelines for Protected Area Delegation and show how increasing levels of responsibility in typical Management Plan Sub-programmes might be taken on with increasing levels of delegation

Table 5-1 1 Sample Delegation of Function Table

Level of Delegation	Main purpose	Typical functions delegated
I	**Familiarization** and **trust** building	Monitoring activities Gathering information and Public contacts
II	Taking **control** of use	Level I plus Collecting user fees and Implementation of Enforcement
III	Gaining wide ranging **support** for protection programs	Level II plus Implementation of Education & Public Relations
IV	**Protecting** important resources and abating serious problems	Level III plus Implementation of Protection & Conservation
V	Achieving **self stewardship** of the resources of the Protected Area	Level IV plus Implementation of Recreation & Tourism

Table 5 1 2 Typical Levels of Delegation	DELEGATION LEVEL				
MANAGEMENT COMPONENTS	I	II	III	VI	V
I PROTECTION & CONSERVATION					
Monitoring	✓	✓	✓	✓	✓
Coordinating research/data collection			✓	✓	✓
Biodiversity/natural resources conservation				✓	✓
Conducting research/data collecting				✓	✓
Community income generation				✓	✓
II RECREATION & TOURISM					
Liaison with recreation users			✓	✓	✓
Liaison with tourism providers			✓	✓	✓
Provision of information and services					✓
Provision of facilities for recreation uses					✓
III EDUCATION & PUBLIC RELATIONS					
Public information	✓	✓	✓	✓	✓
Public involvement			✓	✓	✓
School liaison			✓	✓	✓
School programs			✓	✓	✓
IV ENFORCEMENT					
Monitoring compliance with Protected Area regulations	✓	✓	✓	✓	✓
Monitoring compliance with NRCA regulations	✓	✓	✓	✓	✓
Personal contact to encourage compliance		✓	✓	✓	✓
Full enforcement		✓	✓	✓	✓

An local organization may receive phased delegation reflecting its growing experience and capacity Alternatively a specialized organization may be given long-term authority for a particular aspect of the protected area s management activities The NRCA s preferred practice is to delegate primary functions to one LME the umbrella organization The umbrella LME will coordinate and monitor any other organizations to which authority for specific functions or areas is delegated Although no cases yet exist it is possible that multiple delegations could be made in a large area without an umbrella organization

Criteria For Delegation An LME must have or be able to develop the capacity to fulfil the functions described in Section 5-1 5 Whether it aims to be an independent or an umbrella organization an LME should be broadly representative of local interests and other stakeholders non-profit and non-political if it is to be delegated authority by the NRCA It must committed to reflecting the opinions of its wide base of support in its management structure and decision making It should also have motivated staff with proven environmental management experience an appropriate Management Plan and the ability to mobilize volunteer and other local agencies

The following is taken from the NRCA s Guideline for Delegation of Management Authority

The NRCA may on application made by an organization delegate the management of any protected area to that organization if it satisfies the following requirements -

a) it is a body incorporated under the laws of Jamaica and has as one of its primary objects the management of protected areas

b) the organization is able to demonstrate its involvement in environmental conservation activities

c) it has or is able to obtain the financial human and other resources and the technical expertise necessary to manage the area

d) it has established mechanisms of co-operating with agencies and departments of government having functions in relation to the environment as well as private sector organizations and community groups Delegation should be for the period specified in the instrument of delegation

The additional more detailed questions in the following table are intended to assist prospective LMEs and those involved in the selection of process

Table 5-1 3 Criteria for Local Management Entity Selection

1	Has the entity expressed interest in being delegated management authority for the area?
2	Does it have broad local representation, operating as a non-profit organization under a BOD?
3	Does it have experience in seeking, managing and disbursing funds?
4	Does it have experience with writing grants and managing projects?
5	Has a local environmental trust fund been established / planned?
6	Does it have an executive director other staff and experienced volunteers?
7	Does it have an office vehicle and other equipment?
8	Has it any experience in environmental monitoring (e g water quality/coral cover/tree cover)?
9	Has it been actively involved in local environmental awareness and education?
10	Has it organized workshops, training community forums, etc
11	Has it implemented or coordinated any environmental improvement projects?
12	Has it any past experience or current capability in natural resource management?
13	Is it / how does it plan to become financially self-sustaining?
14	Does it have a democratic decision-making process?
15	Has it prepared an Operations and Financing Plan for the Protected Area?
16	Does there appear to be community consensus that this organization should be the LME?

5-1 7 Management Structure Options

The draft EPF (Section 6 2 3) lays out the essential options for the Black River managed resource Protected Area management structure and local management entity or entities Those options remain valid and are therefore merely summarized here Candidates for delegation of management authority as the umbrella LME include

- A restructured SEEPA with an expanded mandate and membership (this change appears to be under way),
- A new umbrella organization or an expanded existing organization representing a range of stakeholder interests which would nurture community-based organizations (CBOs) and act as a forum to coordinate and articulate member groups concerns,
- South Coast Resort Board, recognizing its broadly representative membership management and leadership experience and accountability but also its intrinsically tourism-related mandate and relative lack of experience with non-developed environments

Candidates for delegation of specific functions include the Community Development Foundation and the Malvern Science Resource Center, among others

The draft EPF does not address the matter of a Local Advisory Committee (LAC) According to the NRCA s Guidelines for the Establishment and Functions of Local Advisory Committees, an LAC is a voluntary group of people appointed by the NRCA to advise on planning, management, financing and operations of a protected area Its membership is drawn primarily from the larger body of community and area stakeholders It is advisory, meaning that its function is not regulatory or operational Rather, it is to provide guidance to those directly responsible for making decisions related to the area (LME NRCA, Partners) It is a committee, which means it functions according to operating procedures generally associated with groups of people working together

The LAC is established to act as a link between protected area management and the communities within or adjacent to it promote management which is responsive to local cultural values and to the variety of stakeholders and interest groups In keeping with an agreed management plan provide information regarding activities to be allowed/prohibited in the protected area and buffer zone promote awareness acceptance and compliance with regulatory measures The NRCA's LAC guidelines outline steps in forming a LAC and the roles responsibilities and operational policies and procedures of LACs

In the case of Black River it may be helpful in the short term to establish a Local Advisory Committee to assist in the selection of a Local Management Entity and preparation for delegation However the principal management strategy of the Black River Managed Resource Protected Area is to involve stakeholders in active policy review, monitoring and project implementation For long-term effectiveness in achieving objectives, it may be desirable to work through an active network of existing organizations such as the Tourist Board, CDF and Neighborhood Watch groups, and newly-established Focused Committees and Resource User Councils Representatives of the user, community and other stakeholder groups should serve on the LME Board unless the magnitude of operations warrants continuation of a separate LAC

5-1 8 Selection Process

Black River, stakeholders have the option during the review of the draft Environmental Policy Framework and draft Management Plan, of selecting a preferred management structure and proposing a candidate LME or advocating an interim LME or management arrangement

Alternatively, they may propose another type of selection process However the urgency of the need for declaration management and delegation is great because of the NRCA s staff limitations and the rapidity of change in the proposed protected area

5-1 9 Recommended Action Plan

Phase I Immediate and Short-term (Preparation for Delegation)

1 Review EPF and Options for Management and Protected Area Organization (NRCA Lead)

a) Review the draft EPF and options for protected area organization and management

b) Select Protected Area organization to be included in request for Declaration

c) Select preferred organizational model

d) Select proposed Local Environmental Management Entity (LME)

The draft EPF (Section 6 2)guides these discussion Decisions should take account of the NRCA s desire to see full delegation as soon as possible and its inability to offer more than environmental wardens in the future protected area

2 Decide on Interim Management Arrangements (NRCA Lead)

If desirable select an organization to oversee initiation of local environmental management coordination with the NRCA with protected area declaration and assistance to the proposed local with preparation for delegation

3 Initiate Small Priority Projects (LME/ and local partner lead)

a) Reexamine and refine resource user projects (shrimp- and thatch-related see draft EPF Annex F)

This effort should renew consultations with the user groups to rebuild confidence and the credibility of the proposed protection of the environment of the Black River Morass with improved living standards

b) Prepare proposals and seek funding perhaps through the CDF or directly from the EFJ or other donors Decisions should take account of the successful management experience of the CDF in onlending EFJ funds

c) Oversee projects carried out by user groups and others providing training and reporting assistance

4 Initiate Local Environmental Management Office (NRCA Lead)

a) Implement NRCA s long-promised Black River office ro serve the south-western region of Jamaica

b) Seek and secure low-rent/no-rent office space to be shared by the NRCA regional staff the selected LME and other local groups

c) Seek used office furniture and equipment (perhaps through appeals to local businesses or to corporations that have a stake in or influence on the Black River environment

5 Prepare for Delegation

a) Apply for Donor Assistance with Salaries (Executive Director and office assistant)

This action should take account of the following central lessons learned in local NGO and protected area management to date First a local environmental management entity is limited in its effectiveness without a full-time basic staff However secondly it is important to be able to prove that a local organization can carry out low-cost projects with limited financial assistance and to demonstrate longevity and consistent commitment

b) Hire staff

c) Convene committee to review further refine and prioritize the draft Management Plan

d) Develop administrative and financial procedures (with NEST assistance)

e) Prepare first Operations and Financing Plan as part of a formal request to the NRCA for delegation of management functions (NRCA assistance)

f) Develop membership and revenue-generation plans

g) Convene Local Advisory Committee (and/or Board of Directors of the candidate LME)

h) Participate in drafting binding contracts between the NRCA and the LME to perform certain duties in instances when each party is bound to perform those duties

l) Take steps to procure liability insurance to cover defense and satisfaction of claims made against the LME and its staff for actions arising out of its activities associated with management of Protected Areas

(The LME and staff will be treated as agents of NRCA in regard to civil and criminal actions arising out of reasonable actions taken within the scope of the functions delegated to the LME)

j) The interim or candidate LME will begin to work with the NRCA, the community and other stakeholders in order to gain experience and visibility

Its activities should focus on implementing a public awareness campaign (see Sub-Programme 7)

k) The interim or candidate LME will assist the NRCA as required (with stakeholder workshops warden orientation recruiting local warden candidates, etc)

Phase II Mid-term (Post delegation)

It is not possible at this stage to predict the length of the first phase Once delegation has occurred, however the LME should embark immediately upon the following

1 **Revision of Management Plan** It should be possible at this stage to be significantly more focused given certainty about the management organization and developing structure and growing knowledge of the capabilities and needs of existing and potential partners (NRCA assistance)

2 **Warden Deployment** The LME should be able to take over the deployment and coordination of wardens including those fielded directly by the NRCA

3 **Research and Projects** The LME should seek funds to support participation in the rapid ecological assessments that are top priorities for the NRCA

4 **Sustainability** The LME should focus on rapid development of membership, activities which can generate income (including user fees that need to be charged on river tours, rafting and any new tourist activities

5 **Creation of a web-site**

5-1 10 NRCA Roles and Responsibilities

The NRCA as the lead Government agency charged with overall protection and sustainable use of the nation s environment and natural resources including the development of the National Protected Area System will within the Black River Managed Resource Protected Area undertake the following immediate (emergency) actions and longer-term actions

1 Establish the Black River Regional Office of the NRCA and begin a program of priority activities

2 Lead the review of the draft EPF the draft Management Plan and the EPF and Protected Area Action Plans (NRCA lead in association with one or more local organizations),

3 Complete the Managed Resource Protected Area regulations and step up enforcement of other applicable regulations,

4 Achieve declaration of the proposed Black River Managed Resource Protected Area

5 The office should also assist in efforts (with the increasing participation of the St Elizabeth Parish Council) to

- provide early guidance to developers, landowners and other prospective project sponsors
- monitor and prevent unpermitted development activities
- ensure that any proposal for tourist or ecotourist activity in the proposed Black River Managed Resource Protected Area receives thorough environmental impact assessment in the full context of the EPF issues and recommendations
- review EIAs from a more comprehensive and integrated point of view

6 Obtain new air photo coverage of the proposed Black River Managed Resource Protected Area and update maps update ownership information and prepare maps

7 Plan and carry out baseline research in the Black River Lower Morass (to be funded in part by IUCN Ramsar funds),

8 Apply for designation of the Black River Upper Morass as a Wetland of International Significance

9 Undertake a Rapid (but detailed) Environmental Assessment of the Black River Upper Morass (including the development of a proposal and the search for funding to supplement the funds available from the IUCN following designation

10 Convert existing Black River (EPF) mapping to ArcInfo database refine mapping, including digitization of benthic contours and conditions make a determination about the location of a central environmental data base and ensure that regional office has full access to the data base,

11 Appoint a secretariat" at the NRCA PAMB to provide oversight and liaison between the proposed LME and the NRCA and its sister agencies in Kingston

12 With NEST undertake a program of community outreach and assist with environmental and economic improvement projects (NRCA guidance and environmental review)

13 Add at least one wardens to the patrolling of the Black River and environs field a minimum of two more wardens to patrol beaches and coastal areas and work with fishermen and to follow up complaints or information provided to the regional office

14 Assist local organizations with designing and implementing a program of environmental education in the proposed Black River Managed Resource Protected Area

15 Develop a program of environmental sensitization for the Judiciary

16 Lobby for preparation of comprehensive sanitation plan for Black River

17 Expand Black River Carrying Capacity Study in accordance with the recommendations of the draft EPF (p100) ,

18 Conclude Cooperative Agreement with Appleton Distillery immediately, and then

19 Focus on agreements with the river tour boat operators, the PCJ and the Parish Council

5 2 CONSERVATION, PROTECTION AND SUSTAINABLE HARVEST OF NATURAL RESOURCES

5-2 1 Introduction

The aim of this sub-programme is to suggest ways to manage and conserve the natural ecosystems of the area, the ecological and economic services they provide and the rare and endangered and economically important species they support

5-2 2 Vision

Design and implementation of the programme will

- increase the contribution of the Black River area in its natural state to the local and national economy through sustainable use of selected natural resources,
- conserve and restore rare, endangered and economically or ecologically important species and ecosystems especially those characteristic of the MRPA or of national or global significance,
- conserve critical ecological processes,
- ensure that when natural resources are used or harvested this is done sustainably, within the carrying capacity of the area and where uses cannot be sustained alternatives are sought and
- reduce environmental degradation resulting from past present and future destructive practices (including pollution illegal mining and mining without effective rehabilitation, deforestation illegal construction and inappropriately located development)

5-2 3 Strategy/Approach

The vision will be achieved by

- identifying priority resources and species for conservation management or protection
- expanding review of all projects that could impact, directly indirectly or cumulatively on the natural resource base
- designing and implementing specific management plans for areas resources and species
- designing incentives reinforced by improved enforcement,
- developing and implementing special projects and
- integrating all actions into an overall vision for the managed resource protected area

All programmes will

- be based on the best available scientific data (but not impeded by lack of data in a crisis) and
- involve stakeholders in design management and implementation of resource management programmes

The issues and needs are laid out in the following series of tables, under Ecosystems Species, Sustainable Harvest and Non-renewable Resources The closely-related Water Resources and Cultural Resources are presented as separate Sub-programmes

5-2 4 Ecosystems

Ecosystems in need of special management will be selected on the basis of their rarity, endangered status, ecological linkages and actual or potential economic importance A description of the main ecosystems was provided in Chapter 3 and a summary of their management needs is provided in Tables 5-2 1, 2 and 3 below More details can be found in Chapters 6 and 7

Table 5-2 1 shows that several themes run throughout

- The first theme is the need for up-to-date data Surveys in the early 1980s (though wide-ranging and detailed) did not cover the whole area and are out of date A quick ecological assessment and mapping of the whole proposed MRPA is needed to help determine priorities for action The lack of information should not be a deterrent to beginning action wherever priorities are clear
- Another theme is the need for analysis of carrying capacity, and for the development and implementation of area-specific management plans to ensure that the carrying capacity is not exceeded Suggestions for these are provided in Chapter 6 which also begins to identify areas where profitable activities can be promoted without detriment to the natural environment
- Also central to the approach is the need for public education about the importance of ecosystems and appropriate approaches to development This is essential to the success of the third approach mentioned below, the development of cooperative partnerships to protect enhance and manage resources

Table 5 2 1 Marine, Saline and Coastal Ecosystems of Black River and Environs, and their Management Needs

Ecosystem	Priority Level	Main Linkages	Issues	Suggested Actions*
Beaches	High	Recreation and tourism Sea turtle and crocodile conservation Revenue generation	Beaches lack facilities and are not used appropriately Beach water quality threatened by pollution	- Identify and classify beaches according to function and carrying capacity (see ___) Develop management plans for specific beaches - Seek means to implement plans (e g though concessions and partnerships) - Control coastal pollution Follow NRCA policy
Rocky shores and cliffs	Low	- Coastal protection - Tourism - Possible rare species	- Lack of data	Ecological assessment
Sand dunes	High	- Coastal protection - Tourism - Possible rare species - Rare aeolian fossils	- Sand mining Erosion as a result of removal of vegetation and trampling - Lack of data	Protect remaining coastal dunes (Treasure Beach Great Bay Sandy Ground) - Ecological assessment
Tidal mud flats	High	- High productivity	- Coastal erosion - Changes in water regime in coastal lagoons	- Protect mud flats (Font Hill)
Sea grass beds	Medium	- Fisheries conservation - Coastal protection - Species conservation	- No data Probably affected by siltation pollution loss of top grazers (manatees green turtles) anchoring Beach front beds cleared to improve swimming	Ensure sea grass beds are protected from clearance - Improve coastal water quality Provide mooring buoys
Coral reefs	High	- Fisheries - Beach protection Recreation and tourism	- lack of information about status and distribution affected by coastal pollution anchoring of boats - over fishing using pots and spear guns	Identify best areas for fish stock replenishment and protect as fish sanctuaries if necessary - Identify suitable sites for dive tourism - assess need for mooring buoys - control coastal pollution
Mud	High	- Marine productivity	lack of information	Assess
Coastal forests and woodlands	Medium	- Beach protection - Species conservation - Landscape conservation	lack of information about status and distribution Clearance for development Degradation by selective harvest and grazing	Identify best examples and protect them Encourage replanting on private property

Mangroves	High	- Fisheries - Beach protection - Recreation and tourism Species conservation	- Charcoal burning - Lumber extraction Removal for coastal construction - Bad image Damage by severe weather	**Protect and restore all remnants** - Assess potential for sustainable use Select sites for interpretation Follow NRCA policy

5-2 2 Freshwater Ecosystems

Ecosystem	Priority Level	Main Linkages	Issues	Suggested Actions*
Riverine forests	High	Protection of river banks	- Clear cutting for agriculture and timber	- **Protect all remnants** (near Lacovia)
Rivers and streams	High	- Fisheries - Water resources - Species conservation - Landscape conservation - Recreation and tourism	- Pollution from point and general sources (but no overall study of relative importance and impacts of sources - Excessive use of Broad River by tour boats - Poor use of scenic attributes in Middle Quarters - Demand for increased abstraction of water from Black River for irrigation of Pedro Plains	- Evaluate sources of pollution develop a watershed strategy including cooperative agreements to reduce or mitigate pollution - Evaluate need for restoration/rehabilitation - Develop area-specific management plans - Reexamine carrying capacity for tourism and develop a strategic plan - Examine impacts of irrigation plans
Ponds and springs	High	- Species conservation - Water resources - Landscape conservation	- Many ponds being lost to development and agricultural expansion	- Develop area specific management plans (e g Wallywash Pedro Ponds Black River Spa) - Ensure ponds protected from development and drainage
Herbaceous wetlands	Medium	- Fisheries - Flood control - Recreation and tourism - Species conservation	- Changes in drainage channels and dykes - Siltation from upper watershed - Pollution Conversion to agricultural land or fish farms (often unsuccessful) - Bad image	- Protect all wetlands - Select areas for restoration Select sites for interpretation Extend Ramsar declaration to include Upper Morass
Seasonally flooded pasture	Low	No data	- No data	Assess

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Gullies and seasonal watercourses	Medium	- Erosion control - Refugia	- Timber extraction	Assess significance
Limestone islands	High	Genetic resources - Craft materials	- Timber extraction	Ecological assessment Protection of selected areas

Table 5-2 3 Terrestrial Ecosystems

Ecosystem	Priority Level	Main Linkages	Issues	Suggested Actions*
Dry limestone forest or woodland	High	Erosion control Bird habitat Scenic value Rare species	- Charcoal burning - Clearance for agriculture - Selective extraction of valuable species	Protect best examples and manage others for sustainable harvest
Savannas	Medium	Lignum vitae resources Scenic value	- Conversion to housing and ribbon development	Education and zoning
Pedro Plains agriculture	Medium	Sustainable agriculture Scenic value	- Conversion to housing	Education and zoning
Caves	Medium	Bats and rare species Tourism	- Guano mining	Ecological assessment and protection of best examples

5-2 5 Species

Species selected for special attention in this section meet one or more of the following criteria

- are internationally classified as Threatened (Critically Endangered Endangered or Vulnerable) according to IUCN Red Book criteria
- are nationally considered Threatened or Rare (criteria and lists yet to be developed so an *ad hoc* list has been used) or in need of special management or protected under the Wild Life Protection Act or other local legislation
- are listed under one of the three appendices of the SPAW Protocol of the Cartagena Convention (which came into force in 1998 -- Jamaica acceded in 1998 and is therefore obligated to manage the species included on its three appendices)
- are listed under the CITES convention
- are thought to be keystone species (species on which many others depend because of their ecological linkages)
- are introduced species that have become a threat to indigenous biodiversity and need special management control or eradication

Chapter 7 contains draft outline management plans for the following species and groups of species crocodiles sea turtles pond turtles manatees West Indian Whistling Ducks water hyacinth Other species/species groups requiring special attention include threatened plants game birds shorebirds Shiny Cowbird sharks and rays

Table 5 2.4. Mammals and Birds

Species or Group of Species	Priority Level	Main Linkages	Issues	Suggested Actions*
West Indian Manatee	High	Aquatic productivity and food chains Tourism Conservation	- Illegal hunting No protected habitats	Implement national recovery plan including Increase public education **Improve law enforcement** Protection of most important habitats specially Great Bay and Font Hill
West Indian Whistling Duck	High	Wetland function and regeneration Tourism Conservation	- Illegal hunting - Habitat destruction Lack of information on habitat use - No protected habitats	**Complete survey of habitat use and distribution** Develop recovery plan Protect important habitats (including Elim and Parottee) More public education Develop at least one **Watchable Wildlife Centre** (see interpretation) **Improve law enforcement**
Other Waterfowl (including other resident and migratory ducks shorebirds seabirds specially masked duck crakes and rails Caribbean Coot Least Tern	Medium	Wetland function Tourism Conservation	Habitats threatened by development - Lack of interpretation - Illegal hunting and pressure to open duck hunting season	Protect and manage important habitats including Parottee Great Pedro Pond Black River Upper Morass Font Hill mudflats and ponds Improve interpretation (including hides and interpretative materials) Resolve conflicts with hunters
Game Birds (including White-winged Dove White crowned Pigeon Mourning Dove Blue winged Teal Green-winged Teal)	Medium	Columbids Regeneration of forests and wetlands Some columbids are pests in rice	- Lack of enforcement - Lack of information about populations - No management plans for game species	Most of area has already been gazetted as Game Sanctuaries Enforce regulations year round Monitor populations and infractions Develop management plans as necessary Develop public education materials as necessary
Migrant Land Birds (specially warblers)	Low	Control of insect pests Conservation	Habitat destruction	Develop recovery plan Protect and manage important habitats specially woodlands at Font Hill
Endemic species	Low	Forest regeneration pollination etc	Habitat destruction	No special actions required
Shiny Cowbird	Low	Threat to endemic birds	None known	Monitor populations and effects on endemic species

Table 5 2 5 Reptiles, Amphibians and Fish

Species or Group of Species	Priority Level	Main Linkages	Issues	Suggested Actions*
American Crocodile	High	Improvement and maintenance of fish stocks Conservation Develop recovery plan	Loss of nesting habitat Bad image Illegal killing and capture - Lack of data on status and habitat use - Font Hill only protected habitat	**Identify and protect important habitats** (specially nesting and breeding habitats) including Parottee Thatchfield and Font Hill southern Lower Morass Improve **public education** and resolve conflicts with fishermen and general population **Survey** important habitats specially Font Hill
Sea Turtles	High	Conservation	- Illegal killing - Loss and disturbance of nesting beaches - No protected habitat Lack of public awareness	Implement Sea Turtle Recovery Action Plan **Protect and manage important beaches** (specially Luana Point Malcolm Bay others to be determined) Increase public education **Improve law enforcement** **Monitor important beaches**
Jamaican Slider	Medium High	Pond and wetland function	Loss of habitat	Lobby to include this species on protected list Protect important habitats specially ponds (e g Treasure Beach)
Endemic fish	Medium - Low	Wetland food chains	No data	Survey distribution and abundance If necessary develop management strategies
Sharks and rays	Low	Potential threat to bathers	Fishing	Evaluate populations and level of threat to bathers
Keystone fish species (Grey Snapper Snook)	High	Wetland and marine ecosystems	No data	Monitor catches

Table 5-2 6 Invertebrates

Species or Group of Species	Priority Level	Main Linkages	Issues	Suggested Actions*
Corals (white black hard soft)	High	Coral reef health	Illegal collection	Improve public education Increase enforcement
Arthropods crabs and shrimps	High	Fisheries Marine productivity	Pollution No data	Research programmes identify critical habitats
Arthropods lobsters	High	Fisheries	Over fishing	Encourage trial use of cabanas
Arthropods insects	?		No data	Encourage research
Molluscs	?		No data	Encourage research
Other groups	?		No data	Encourage research

Table 5-2 7: Threatened and Economically Important Plants and Pest Species

Species or Group of Species	Priority Level	Main Linkages	Issues	Suggested Actions*
Royal Palm	High	- Wetland structure and food chains	- Fire and grazing inhibit regeneration - May be affected by disease	**Protect and restore swamp forests**
Anchovy Pear	High	ditto	- No data	**Protect and restore swamp forests**
Swamp forest hardwoods	High	- ditto - Genetic resources	- Selective extraction	**Protect and restore swamp forest**
Night blooming Water Lily	High	- Genetic resources	- Loss of ponds	**Protect and restore ponds**
Other rare pond plants			- Loss of ponds	**Protect and restore ponds**
Bull Thatch	Medium	Craft materials		Develop replanting programme
Silk Cotton	Medium	Used to make canoes		Develop a replanting programme in suitable areas (inc limestone islands)
Water Hyacinth	High		Blocks rivers excludes other life impedes water flow and access washes out and decays on beaches	**Develop management plan** Evaluate new macerator and develop other control measures as necessary Seek alternative uses Control river pollution
Irish Moss	Moderate	Commercial collection	No data	Assess importance

5-2 6 Sustainable Harvest of Renewable Resources

Sustainable use of natural resources is the fundamental concept of the managed resource protected area Unfortunately very little is known about how this may be attempted in Jamaica
The development of appropriate plans will eventually be among the core programmes of the Black River Protected Area The following table indicates some of the ways in which to begin

Work was undertaken with shrimp fishers shrimp higglers and thatch craftswomen during preparation of the Draft EPF Projects were designed in concept see draft EPF Annex H) that need further review and funding It will be particularly important to regain the confidence of participants in these proposed projects and to use the projects not only to improve resource sustainability and livelihoods The preliminary work showed interest in and potential for establishing effective Resource User Councils

Table 5-2.8. Resource Use

Activity	Priority Level	Main Linkages	Types of Agriculture	Issues	Suggested Actions
Agriculture	High	Soil Water	Lower Morass Cattle goats sheep ganja dasheen and other vegetables Upper Morass sugar fish farms ganja Font Hill proposed pasture and tree crops Treasure Beach Cattle and goats vegetables near Southfield	- Reduced demand for beef High levels of theft of goats - effects of grazing on regeneration of mangroves and swamp forest - wastage of vegetables due to shortage glut cycles -	- Institute a closed licensing system for grazing in morass with the objective of eliminating graziers by attrition seek alternative crops and means to increase value through processing and production of essences
Forestry	High	All natural woodlands	Hardwood lumber to sawmills Cotton trees for canoes Charcoal (mangroves cashaw) Pot sticks Fence posts (logwood) Roundwood for chicken houses Dry wood for fuel Fuelwood (trial plantation at Font Hill)	These resources are being harvested in an unsustainable way Lumber is being illegally removed from public and private property Similarly people who do not own land burn charcoal harvest fence posts pot sticks and roundwood The species composition of swamp forests has been changed - The protective value of coastal forest is reduced Genetic diversity is lost	Enforce licensing of sawmills - Introduce licensing of chain saws Patrol swamp forests and mangroves subject to illegal use Develop alternative sources of materials Restore swamp forests and mangroves Promote fuelwood plantations

Freshwater fisheries	High	Indigenous fish (e g sleepers) Introduced fish such as Tilapia Shrimp (various species) Crabs - Sport fish such as Snook and Tarpon	Raw fish - Raw and peppered shrimp - Raw and cooked crabs LINKAGES Rural economy Local subsistence Morass food chains Salinity gradients Access to sea	No data about status of freshwater fishery trends (tho no apparent decline) No information about critical habitats - Problems with seasonal availability - Effects of introduced species and risk of new introductions from fish farms changes in land use and new factory at Maggotty further decrease water quality - Use of illegal traps	Carry out survey of fishery to determine critical habitats trends management needs Examine need for closed seasons Examine need for shrimp drying and processing Institute procedures to reduce risk of accidental releases - improve water quality Seek to reduce water pollution - Enforce existing regulations and develop new ones as necessary - instigate a freshwater fishers council to develop strategies
Marine fishery	High	Various commercial fish and lobster	Raw fish LINKAGES Coastal economy Local subsistence Coastal productivity Juvenile fish Salinity gradients Access to wetlands	- Over fishing - Use of pots and spear guns and beach seines - Decline in quality fish - Possibilities for deep sea fishing and sport fishing not developed - Possibilities for mariculture (lobster cabanas Irish Moss oysters	- Protect selected areas to facilitate restocking - control fishing methods in selected areas - institute fish pot exchange (if necessary) - Develop sport fishing - Examine feasibility of mariculture e g increasing lobster harvests using casitas - Start a marine fishery council to develop strategies - Develop management plan
Game	Medium	Doves and Pigeons Ducks Wild Birds	Plucked birds	- Over-hunting may cause decline in game birds - No scientific data available to facilitate decision making An open season for ducks could threaten other species - No data about the effects or nutritional contribution of birds hunted by slingshot and caliban	- Enforce seasons dates bag limits etc - Monitor populations and shooting statistics to determine effects of hunting - Seek data on ducks to support a rational position on duck hunting - Suggest survey of effects of hunting by catapult and caliban
Medicinal plants	Low	No data	Dried and fresh herbs roots	- No data on extent of medicinal collection use and trade - No data on possibilities for development	Assess possibilities

Craft materials	Medium	Bullthatch Other thatch Phragmites Typha Bamboo Silk Cotton Trees	Baskets mats and hats made to local traditional designs Fish pots Crab traps Thatched roofs Dug out canoes (e g "pot and spoon design typical of area)	Basketry drying out because of poor returns shortage of materials - Traditional thatched houses being replaced by zinc roofs Boat tours make it difficult to use shallow draft canoes - Silk Cotton resources exhausted must be brought from above Maggotty	Save traditional designs - Improve marketing and profit margins Women replant thatch and regain control of raw materials - Replant silk cottons Develop craft villages where visitors see process of making goods and buy goods

5-2 7 Non-renewable Resource Use

Clarity of policy cooperation and enforcement in the area of renewable resource conservation will help to avoid future encroachment on those resources by inappropriate and irreversible activities including mining and development At the same time far greater vigilance will be required to report and stop illegal activities and to anticipate the often subtle future impacts of proposals or requests for legal development activities

Residents and organisations in the proposed Managed Resource Protected Area will need to request early revision of the Development Plan and Development Order by the TCPA/TPD and to be active participants in the planning process using the draft EPF and the draft Management Plan as the foundation for decisions Whether the TCPA/TPD process occurs before or after declaration it will be imperative to ensure congruence of the plans

5-2 8 Strategies and Action Plans

With a very large number of important and pressing issues to deal with the selection of starting points and areas of focus will be a major problem facing the fledgling administration of the new protected area Choices will be made partly on the basis of systems of criteria that will be developed as the protected area develops and partly on the basis of situations and opportunities that will unfold at the time

The following table indicates some possible directions their priority level and the phase of the project at which they are likely to be considered Phase 1 is the Preparation for Delegation Phase 2 Delegation and Phase 3 Post-delegation (see Sub-programme 1 Administration and Staffing)

Table 5-2 9 Action Plan for Resource Conservation, Protection and Sustainable Harvest

	ORGANISATION	PHASE	PRIORITY LEVEL
1 Local legal framework			
Review existing laws and regulations and determine whether they provide adequate powers for protection of selected species ecosystems and areas administration of use of resources and the types of powers and incentives needed (e g for conservation on private land sustainable harvest of resources)	NRCA NPPAW NRCA LAW FoD FID NRCA NPPAW	1 3	High
▪ Consider candidate species for addition to the list of protected species (e g Jamaica Slider)	NRCA LAW	1-3	Medium High
Initiate development of new regulations if necessary (e g for new categories of zones)	NRCA NPPAW /TCPA	1	High
▪ Use existing legal framework to achieve objectives in short-term (e g Tree Preservation Orders)		2-3	
2 International legal framework			
▪ Ensure that all SPAW species are managed according to the Protocol	NRCA NPPAW	1-3	Medium
Ensure that the provisions of the Ramsar Convention area observed	LME		Medium
Consider delegation of additional Ramsar sites as appropriate (including the Upper Morass and Great Pedro Pond)		1-3	
	NRCA NPPAW		High
	LME	1-3	
3 Law enforcement			
Improve enforcement of relevant laws - Wild Life Protection Act (specially re manatees crocodiles hunting season) - Forests Act (licensing of saw mills)	NRCA Enforcement	1-3	High
4 Research and monitoring			
Carry out quick assessment of whole proposed protected area	NRCA-NPPA	2	High
Map ecosystems (based on 1999 aerial photographs) and compare with 1992 Commission studies of selected species (including West Indian Whistling Duck crocodile) to assess habitat needs and ensure that they are fully covered in proposed protected area		2	High
		1 3	High
Develop priority lists for study			
Select indicators and develop monitoring programmes		1	
Monitor selected parameters (e g bird numbers sea turtle nest sites see specific action plans)		1 3	Medium/High
		1 3	High
5 Management and recovery action planning			
Develop and implement management plans for selected species resources and areas as necessary monitor and revise as necessary	NRCA-NPPAW/ LME	1 3	High

Table 5 2 9 Action Plan for Resource Conservation, Protection and Sustainable Harvest			
	ORGANISATION	PHASE	PRIORITY LEVEL
6 **Habitat restoration** Identify ecosystems and sites in need of restoration ▪ Develop and test restoration techniques	 NRCA-NPPAW/ LME	 1 3	 Medium Medium
7 **Boundaries and zoning** ▪ Review boundaries and zoning and ensure they are sensible practical and adequately address habitat needs	NRCA-NPPAW/ LME	 1 3	 Medium
8 **Public education, public relations and interpretation** Identify priorities for public education Work with educators to develop appropriate programmes Establish users councils for freshwater and marine fisheries shrimpers crafts others to be determined ▪ Plan and construct interpretation centres hides watchable wildlife ponds story boards nature trails and signs	 LME NRCA/ LME	 1 3 1-3 1-3 1-3	 Medium Medium High High
9 **Special projects** Develop and seek funding for special projects such as shrimp industry development fisheries management cultivation of craft materials others to be developed	LME/User Councils	1 3	High

5-3 WATER RESOURCES

5-3 1 Introduction

Perhaps no other topic than water - availability use quality the sharing of water supplies or the effects of drought and flooding - is likely to arouse the interests of everyone in the area to the same extent or to have such far-reaching effects on the ecology and economy

5-3 2 Vision

The vision is that through coordinated, sustainable management of water resources community water needs will be met without detriment to natural processes Water resources will be maximized through watershed conservation and efficient use The quality and quantity of water resources will be monitored The water balance of the rivers and wetlands will be maintained to ensure that valuable natural processes are conserved Available resources will be shared equitably

5-3 3 Purpose

This programme will provide the mechanisms needed to ensure the wisest use of water resources in the area

5-3 4 Desired Outcomes

The main outcomes will be

- Improved coordination between agencies responsible for water production quality delivery and use
- More efficient use of water,
- More equitable sharing of water resources,
- Improved water quality in rivers springs and ponds
- Long-term security of water supplies

5-3 5 Existing Conditions

The water resources of the Black River Lower Morass include the surface water flows of the Black Middle Quarters YS and Broad Rivers (all of which originate in the Cockpit Country) plus storm water which enters the morasses via the seasonal gullies on the hills around the basin The surface water is supplemented by groundwater provided by the Limestone Aquifer (also largely dependent on the Cockpit Country as a collection area) which forms many springs and upwellings in the morass, the surrounding hills and even under the sea To the south east of the morass lies Wallywash Pond the largest freshwater lake in Jamaica

In the Lower Morass as throughout the entire watershed, the water resources of the Black River are of crucial importance to the inhabitants (human and otherwise) for a wide variety of uses including drinking bathing and irrigation commercial water supplies transportation, tourism and recreation, waste disposal and dilution, fishing chemotherapy and biodiversity support

The continued viability of the water resources and of the river system and the water balance of the wetland is threatened by *decreased flows and increased siltation resulting from deforestation and inappropriate land use in the surrounding hills and Cockpit Country, pollution from rum distillation, chemicals from heavy industry domestic sewage and washing, agricultural chemicals, and over-abstraction of water from the river and wells, leading to saline intrusion* See Table 5-3 1 for a summary of the factors affecting the water balance and Table 5-3 2 for a summary of uses of and threats to water in the Black River (See also EPF Chapters 3 and 4)

A critical source on pollution in the Black River Morass is the discharge of dunder from Appleton Estate It has been nearly 30 years since the tracing of the dunder was carried out, confirming that Appleton is the polluter and they are still discharging the dunder into the canal that flows to the sink-hole with continuing contamination of the Elim and Black Rivers "[1] Research may be needed to assess the relative importance of pollution on the Black River (see also Upper Morass) However the evidence is such that a satisfactory agreement needs to be concluded with Appleton by the NRCA and the WRA forthwith

[1] Basil Fernandez Managing Director WRA The Daily Observer March 13 1999

Table 5-3 1 Water Balance in the Black River Morass

WATER IN	WATER OUT
SURFACE RUN-OFF Surface water enters through rivers streams and seasonal gullies which have catchments outside the wetlands (e g YS River Black River) These rivers flow faster and higher after rain and carry large quantities of nutrients and silt in the system **Issues** Increased deforestation and mining will increase the frequency of flash floods and reduce the quality of the water	Most water leaves through the main channel of the Black River where it enters the sea forming a large muddy plume which stretches several kilometres out to sea **Issue** contaminated water from the morass could spread pollution along the coast
GROUNDWATER DISCHARGE Rivers (like Frenchmans Middle Quarters and Broad Rivers) are fed by numerous blue holes and sub-surface springs in the morasses **Issues** The groundwater originates in the Cockpit Country *Deforestation and mining* will reduce the amount of groundwater entering the system Groundwater can be contaminated by domestic and agricultural wastes	GROUNDWATER RECHARGE Water leaks out into aquifers through the limestone and into the sea through the coastal sand bar It also forms freshwater upwellings under the sea If the aquifers are contaminated these upwellings can contribute to marine pollution
RAINFALL **Issue** Deforestation in the morass and environs including a large part of Cockpit Country could reduce rainfall and hence the amount of water entering the system	EVAPOTRANSPIRATION Water evaporates from the surface of the swamp and is transpired by plant leaves This increases humidity and probably increases rainfall in the vicinity **Issue** reduction of vegetation e g by burning or cutting could reduce transpiration
SEAWATER Seawater seeps in under the morass and up the rivers and can be found more than 7 miles inland It is held back by the freshwater in the morass **Issue** If too much water is taken out of the system more salt water will penetrate further inland and wells will become unusable	EXTRACTION OF WATER FOR DOMESTIC AND AGRICULTURAL USE Water is taken from the system by NWC (pumping stations at Luana) and through private wells and pumps **Issue** are EIAs required? Suggested withdrawal of small volume (5%) could have significant consequences

One of the most controversial issues is the recurrent proposals to irrigate the Pedro Plains using water from the Black River at or above Lacovia and Wallywash The demand for irrigation increases during times of drought Construction of a canal at Lacovia was started in the 1980s but was not completed

If an irrigation system was to be constructed the water demand would be very great and probably could not be fully supplied from wells and surface run-off in the plains Most plans have suggested taking water from the Black River This would reduce flows in the river specially in times of drought There would be a risk of increased saline intrusion into the groundwater Fires would probably be more frequent and severe and the productivity of the river system might decline Therefore *environmental costs of irrigation (including increased salinity of irrigated soils on the Pedro Plains and the abandonment of traditional farming practices) and alternatives to large-scale irrigation such as improved rainwater collection and storage should be carefully evaluated*

Deforestation in the hills around the morass is probably increasing the frequency and severity of flash flooding in the surrounding communities as well as the sediment loads of the rivers This could be exacerbated if bauxite mining is permitted in the hills Silt in the runoff may be tending to fill in some areas of the swamps, changing their function and further reducing their ability to absorb and retain flood waters *Conservation of the wetland and coastal ecosystems must be planned and implemented in the context of conservation of the surrounding hills*

Table 5-3 2 Black River System Water – Uses and Threats

TYPE OF USE	DESCRIPTION OF USE	ENVIRONMENTAL ISSUES
Domestic	Local communities depend on water from small springs and dew ponds for water for drinking and irrigation They bathe and wash clothes and vehicles in the rivers	The value of this water has never been assessed and is certainly undervalued Washing in the river introduces phosphates detergents and oils
Commercial Water Supply	Water for domestic use and irrigation is extracted from the morass along the Black River at the NWC pumping stations at Luana and Wallywash Salt Spring and at private pumping stations e g Holland	Over extraction of water could increase saline intrusion (see below) When irrigation water returns to the river it carries agrochemicals and silt Channelization of the upper morass and destruction of vegetation along the banks of the rivers means that fewer pollutants are filtered out before they enter the river
Aquaculture	Large fish and shrimp farm at Bartons' Isle takes water from Black River and returns it to the river after use	Careless use of agrochemicals upstream could affect farm Downstream there is a risk of contamination of river with fish wastes and agrochemicals (including antibiotics?)
Hydropower	Hydropower station at Maggotty formerly supplied the grid	Construction destroyed beauty spot Any future scheme could have similar effects and disrupt hydrologic regime and movement of fish
Transportation	River was previously used as natural highway linking communities to Black River and carrying goods (logwood hardwoods agricultural produce) to point of sale	Clogging by water hyacinth (fed by high nutrient levels) now restricts movement forcing greater reliance on roads with accompanying impacts
Tourism	Boat tours operated from Black River attract about 200 tourists per day Rafting from Middle Quarters expected to attract about 20 per day	Many concerns have been expressed about impacts of boat tours on river The carrying capacity study does not adequately address the problems
Waste Disposal and Dilution	Dunder oil and chemicals (including battery acid) are dumped into the river which dilutes them and transports them from the site	River pollution leading to eutrophication death of fish and shrimp growth of water hyacinth loss of amenity values
Fishable Resources	Streams are important nursery grounds for shrimp and fish fish are caught by nets (illegally) hook and line and spear gun Shrimp and crab in pots	Overfishing Pollution Changes in river ecology and water balance could reduce fish and shrimp production
Chemotherapy	Reputedly healing properties of water at Black River Spring	Poor waste disposal at hospital mars spa
Biodiversity	Habitat for many species including rare and endangered plants and animals Small ponds are of special importance	Aquatic ecology (specially plants shrimp) poorly understood Small ponds particularly vulnerable to destruction

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The main responsibility for water and its uses has recently been centralised in the Ministry of Water The Water Resources Authority is responsible for the quantity and quality of water supply under the Water Resources Act (1996) However water use is still controlled under many laws (including the Underground Water Act (1959) Watershed Protection Act (1963) Public Health Act (1974) Irrigation Act (1956) and some administrative responsibilities remain with the NRCA (Watershed Management) Ministry of Health (Public Health Act 1974) and the Ministry of Agriculture (Irrigation Act 1956) and the Mines and Quarries Division (Mining Act 1947)

5-3 6 Strategy/Approach

The first emergency step will be conclusion of a satisfactory and binding cooperative agreement with Appleton followed by agreements with other water polluters

The recommended next step is formation of a water council for the area which will bring all the major stakeholders together to coordinate their programmes and to develop and implement specific programmes and projects as necessary

Another important aspect of the strategy will be to highlight the water-related aspects of each other Sub-programme as it is implemented

5-3 7 Action Plan

The remaining suggested actions presented in Table 5-3 3 will require the cooperation of members of the proposed water council and the leadership of the NRCA and the selected local management entity

Table 5-3 3 Some Suggested Actions for Immediate Implementation

ACTIVITIES	PRIORITY	PHASE	LEAD AGENCY
Establish WATER INTERESTS COUNCIL to discuss and coordinate water use policies and their implementation	High	1-3	NRCA
Develop COOPERATIVE AGREEMENTS e g among NRCA NWA NWC BRUMDEC Pimento Factory Maggotty Cement Factory Appleton Alpart hoteliers boat operators farmers parish council other stakeholders	High	Ongoing	NRCA
Agree to COORDINATE USES Work with other stake holders to develop a policy to ensure coordinated sustainable management of water resources in the watershed with the objective of meeting community water needs without detriment to natural processes	High	1-3	?
Review LOCAL LEGAL FRAMEWORK Collate all existing regulations and laws pertaining to use of water resources and identify needs for new ones	Medium	1-3	NRCA
Review BOUNDARIES AND ZONING Ensure that proposed boundaries are meaningful in terms of water resources management Ensure that zoned uses are consistent with water management requirements	High	1	NRCA

Consider BIODIVERSITY CONSERVATION Determine critical water quality, water level flood frequency and other related aquatic parameters for selected species of aquatic life	Medium	2-3	NRCA LME
Include HABITAT AND RESOURCE RESTORATION - Work with communities in surrounding areas to manage watersheds - Seek ways to reduce ground water contamination by sewage - Aim to improve water quality of Black River to make it comparable with other less polluted rivers in the watershed	Medium	2-3	NRCA LME
Initiate RESEARCH AND DEVELOPMENT OF ALTERNATIVES - Develop research programme to assess sources of water pollution in the Black River system and to develop solutions - Develop programme to assess alternative sources of water (e g catchments)	Medium	2-3	LME
Promote INTERPRETATION, PUBLIC EDUCATION AND AWARENESS - Educate people and users about ways to conserve water alternatives to irrigation impacts of bathing and washing in the river, alternatives to dumping waste in the river	Medium	2-3	LME
Increase ENFORCEMENT AND SURVEILLANCE - Develop regulations about washing and bathing in river and enforce them in selected zones (provide alternatives)	Medium	2-3	NRCA
Start MONITORING (EVALUATION OF EFFECTIVENESS) AND REVISION - Monitor important water quality criteria (if possible involve the community in this) - Install stream gauges and monitor flow rates and levels at selected points - Carry out research into appropriate local biological indicators of water quality - Monitor floods - Monitor rainfall at selected locations in the morass	High	1-3	NRCA WRA
Develop SPECIAL PROJECTS - E g **Big Clean Black River Project** Many of the above actions could be coordinated into a single project to clean up Black River (which might include evaluation of all sources of pollution and suggest strategies to minimize them, monitoring of water quality and use, public education about water conservation evaluation of alternatives to piped water for irrigation, and watershed protection measures for the surrounding hills)	High	2-3	NRCA/WRA/LME

5-4 CULTURAL AND HISTORIC RESOURCES

5-5 1 Introduction

The cultural resources of the proposed Managed Resource Protected Area include not only the historic structures but the landscapes that surround them as well as traditional lifestyles crafts fishing and farming methods and the oral and musical traditions of the people All these contribute to the cultural richness of the area It is hoped that the creation of the proposed managed resource protected area will help to bring much-needed recognition of the psychological and economic benefits that can be reaped from conserving cultural resources

5-4 2 Vision

This sub-programme will create the conditions for integration of the conservation of the cultural heritage of Black River with the conservation of its natural heritage

5-4 3 Purpose

By preserving the cultural heritage of the area and diversifying the tourism product this programme will greatly enhance the other programmes and contribute to their overall success

5-4 4 Desired Outcomes

The main outcomes will be

- Preservation of the special cultural attributes that give the area its unique ambiance
- Conservation of the built environment and landscapes ,
- Increased revenues from tourism for local communities
- Increased employment in restoration projects and crafts
- Increased awareness of the importance and beauty of the cultural heritage of the area and thus increased willingness to keep settlements clean tidy and attractive and
- Increased awareness of the ways in which over the centuries the quality of the natural environment has affected human settlement and culture in St Elizabeth and contributed to human prosperity

5-4 5 Strategy/Approach

The programme will focus on

- using incentives and education to promote restoration of old buildings, improvement of the visual quality of the area and
- integrating the interpretation of heritage and culture and the interpretation of the natural environment in all visitor attractions and interpretation materials

5-4 6 Existing Conditions

Culturally and historically the area is exceptionally well-endowed and every era of Jamaica's history is well represented (Tables 5-4 1 and 5-4 2) A few sites have already been gazetted under the Jamaica National Heritage Trust Act (Table 5-4 3) and the intention to add the historic center of Black River town to the list was recently announced In 1998 the St Elizabeth Homecoming Foundation obtained funding to develop an historic museum in the town

Arawak/Taino Sites Many sites have been identified and the redware sites of Treasure Beach and Great Bay (Great Pedro Ponds) are of great importance *The inventory of sites remains incomplete and sites are being lost to development before they have been documented*

Spanish Period No surviving structures are known, but the Spanish history is interesting, including the site of a settlement and fort at Parottee that pre-dated Seville and was abandoned in 1519 It is not known whether the Spaniards had a settlement at the mouth of El Caovano as they called Black River but Lacovia was their regional capital founded in the 1530s as a community of secret Sephardic Jews fleeing the Spanish Inquisition It appears to have been a thriving town because it was a center of resistence to the English

English/African Period The main towns of the area - Black River and Lacovia - retain many attractive structures There are many great houses and a wealth of vernacular structures many of them probably very old *This inheritance is rapidly disappearing because some people see the old houses as old-fashioned or hard to maintain and traditional building skills are dying out*

Modern Jamaica s ska reggae and dancehall music styles are of great interest nationally and internationally and should be recognised accommodated and included in the mixture of cultural offerings of the area

Skills and Crafts Similarly traditional crafts such as basketry are being lost because *low returns mean that young people are not interested in learning the necessary skills* Shortages of raw materials (including thatch) contribute to the problem Some styles of basket that were characteristic of the area are no longer being made

Historic Landscapes and Ways of Life The economic future of the MRPA as a focus of sustainable development and tourism depends on attention to the visual quality of the entire landscape The entire MRPA Management Plan aims to support the sustainable activities that have been responsible for protecting natural landscapes and creating attractive man-altered landscape For example shrimp fishing in the traditional sustainable manner and use of the river system for transportation are at risk from unsolved pollution and from disregard for sustainable harvesting practices and land use Dryland farming is at risk from changes in agricultural sector and changes threaten the health of the morass New ways to make traditional farming more competitive need to be found (and there are encouraging signs)

In addition to these fundamental needs attention is needed to the protection and enhancement of visual quality retaining and conserving older structures and styles planting hedges requiring greater sensitivity in the routing of power lines and the use of signs imposing and enforcing tree preservation Incentives should be identified to maintain historic structures and/or encourage sympathetic redevelopment for tourism

Table 5-4 1 Summary of Some Major events in the History of the Black River Area

PHASE	DATES	IMPORTANT EVENTS	HISTORICAL REMAINS
Amerindian (Taino/Arawak)	c 600-900 A D	First land clearances and introductions of agricultural species	Many Taino sites especially at Treasure Beach Site at Black River Town destroyed?
Spanish	1494-1655	- 1494 Columbus visits south coast of Jamaica - 1508-1519 Fort at Parottee Introduction of cattle pigs goats European fruits and vegetables and pests Lacovia founded and becomes regional capital - Hatos established - 1655 Diego Pimiento single-handedly defends Lacovia fording	None known except Spanish place-names (e g Pedro Monte de las Uvas)
British/African	1655-1962	1667 Resettlement from Sunnam boosts sugar 1715 Introduction of logwood 1738 Duel at Lacovia 1749 T Thistlewood to Vineyard End of C19th Logwood trade brings boom to Black River Early C20th introduction of synthetic dyes	Many plantation and vernacular houses (mostly c19-20) Lacovia Tombstones Vineyard house Many interesting buildings in Black River town
Jamaican	1962	Drainage of upper morass	Pumping station at Elim

Table 5-4.2 Protected National Heritage, Monuments and Public Gardens

NAME OF AREA	TYPE OF PROTECTION	DESCRIPTION OF SITE	CURRENT STATUS
Ashton Great House	Protected National Heritage no changes without approval National Heritage Trust Act National Heritage Trust	Great House in use as hotel restaurant	Restoration could have maintained more of the original character
Magdala House and Spa	As above	-	
New Forest ruins	As above	-	-
Spring Park	As above	-	-
Hampstead Great House	As above	-	-
Black River court house and offices	As above	Court house build c 1900 In use	Attractive structure Needs repairs and maintenance
Black River Police Station	As above	Old structures In use	Needs repairs and maintenance
Black River Spa	As above	Once attractive and popular spa with reputation for healing	Construction begun and abandoned Improvements needed
Central Black River	JNHT has announced its intention to declare the area a National Heritage Site on March 31 1999	Relatively intact 18th Century town plan with 50 listed buildings	Action plan and implementation required (see Chapter 6-4 Black River Town Sub-area Plan)
Lacovia Tombstone	As above	Historic tombstones on road beside gas station (one recently damaged in accident)	Subject to graffiti Need repairs relocation(?) and interpretation
Bamboo Avenue	As above managed by Superintendent of Public Gardens	Bamboo lined road	Being taken over by squatters with stalls selling fruit and degraded by fire Control urgently needed

5-4 7 Action Plan

The development of a comprehensive plan to protect conserve promote develop and interpret the cultural and historic resources of the area is beyond the scope of the present document Some suggestions are given in Table 5-4 3

The main thrust will be to work closely with the Jamaica National Heritage Trust in the newly declared National Heritage site of Black River town centre However other actions are suggested in the table and specific projects may also be developed for structures areas or themes Priority actions are shown in **bold**

Table 5-4 3 Cultural and Historical Resources – Recommended Actions

RESOURCE	VISION	ACTIONS	REGULATIONS	PARTNERSHIPS
Black River Town including more than 50 historic structures	Black River as nucleus for heritage and ecotourism development of parish	- **Form Black River Redevelopment Committee** - Up-date existing plans for redevelopment - Restore selected structures - Educate public about value of old buildings - Develop system of incentives for restoration Develop visitor interpretation centre - Work with UTech project to complete inventory of historic structures	-Heritage Trust Act list additional buildings - Tree Preservation Orders list important trees (e g at Court House) Other seek ways to provide for incentives and controls	Jamaica National Heritage Trust Large and small property owners JAMPRO JTB LME
Archaeological sites specially Treasure Beach	Interpretation protection or excavation as necessary	- Interpret selected Taino sites at a major tourist attraction - Develop craft industry recreating Taino pottery using traditional materials and methods **- Carry out research to make a complete inventory and description of sites** **- Carry out emergency excavations as necessary**	- Require excavation before development Penalties for wanton destruction	JNHT Property Owners JAMPRO JTB LME
Historic and vernacular houses (including great houses cottages shops)	Sympathetic restoration new uses as necessary	- **Carry out inventory** (with UTECH and JNHT) - Develop incentives - Promote use of traditional building materials and styles - Develop skills bank - Educate people about value of traditional styles and how they may be adapted for modern living	Regulations for incentives (e g tax breaks)	UTECH / JNHT
Historic landscapes ways of life (including Bamboo Avenue savannas around Treasure Beach Black River shrimp fishing techniques scenic roads)	Maintance as living tradition	-Identify important areas - Identify ways of life that maintain the landscapes	Regulations for scenic routes	NRCA /TCPD / Parish Council / LME

Skills and crafts	Crafts and skills regain status in the communities	- **Document techniques before they are lost.** Identify root causes for decline in industry (probably including low returns shortage of materials) - Address root causes e g by improvement of products and marketing craft villages thematic centres (e g logwood museum) cultivation of materials - Develop new products with high value-added - Revive old skills (such as fretworking pottery using local clays) to support new industries (such as restoration of old buildings)	Incentives as necessary	JNHT / Institute of Jamaica / NDB
Oral Tradition	Oral tradition is preserved and becomes part of the attraction of the area	Record oral traditions and seek ways to incorporate them into conservation/tourism product e g local story tellers	None	School children/Memory Bank
Herbal Tradition	Traditional herbal medicines are assessed and where appropriate marketed	Document the medicinal traditions of the area and seek ways to incorporate them into the economy of the area	Control of sale and marketing of herbal remedies	LME /?

5-5 RECREATION AND TOURISM

5-5 1 Introduction

A fundamental purpose of the proposed Black River Managed Resource Protected Area is to support the achievement of St Elizabeth's vision of low-intensity nature, community and heritage-based recreation and tourism As expressed in the draft Environmental Policy Framework, citizens and interests represented by the Couth Coast Resort Board and other organizations have long expressed a desire to see development of the types of tourism that bring the most equitable distribution of benefits require the lowest infrastructure costs involve the least impact on the natural environment

Conversely, development of these types of low-intensity, low-impact moderate return recreation and tourism is required to generate sources of income to support management and improvement of the Protected Area

5-5 2 Vision

Achievement of a Protected Area and network of recreational and tourist facilities and attractions that

- Promote public use enjoyment and economic contribution of natural and cultural resources while
  - protecting threatened species, ecosystems and natural processes
  - insuring that traditional uses are respected
  - insuring that diverse recreational activities are public, available affordable and reasonably convenient
  - protecting and enhancing scenic quality for the benefit of residents and tourists alike,
- Ensure that revenues from tourism circulate in the community as far as possible, and
- Encourage tourism activities in natural areas to contribute to the conservation of their surroundings

5-5 3 Strategy/Approach

The primary strategy will be to involve local communities and stakeholders in the development of an overall integrated programme for the protected area which will be implemented through overall initiatives and sub-area programmes as necessary

A secondary strategy will be to encourage selective development of well-designed high intensity attractions in appropriate locations that will support the marketing of lower intensity activities The latter (such as guided nature hikes) combine active recreation enjoyment of unique outdoor environments and information Community tourism, as opposed to resort development, help will to supplement local incomes and demands that residents become stewards of the environment, natural agricultural and urban, that visitors come to enjoy

> "Community tourism has a lot of potential if it is properly market We are using private homes too for bed and breakfast. We want more hotel rooms in the area but not large hotels " Diana McIntyre-Pike, Country Style Jamaica, reported in the Daily Observer, March 6, 1999)

5-5 4 Existing Conditions

The Need for a Tourism Strategy Tourism is developing rapidly in the area which faces a set of now or never choices about development strategies The most important issues are related to the lack of a coherent vision or planning strategy for tourism in the area, and the consequent conflicts over resource use Specific issues and suggested solutions are summarized in Table 5-5 1 Some are primary concerns of management authority of the protected area others are secondary and would be handled by other agencies with the support of the protected area management team

Table 5-5 1 Specific Issues Related to Tourism in Black River

Topic	Priority Level	Resources	Specific Issues	Suggested Actions
Tourism Policy	High	General environment	No consensus on vision for area incompatible activities threaten whole product	- Develop councils and work to achieve consensus
Local Legal Framework for tourism	High	General environment	- TPDCo regulations for villas may discourage small scale and bed and breakfast operations - New types of activity and zoning may need new types of regulations	- Propose changes in regulations - Propose new regulations
Tourism planning	High	General environment	Tourism development is *ad hoc* and controls are often too little too late - New hotels and villas do not use traditional architecture or consider water energy and landscape conservation/restoration or sewage treatment from the design stage - St Elizabeth Parish Council lacks resources to monitor developments	- Develop project for multi disciplinary team and public consultations - Provide pro-active planning advice - Assist St Elizabeth Parish Council
Tourist harassment and crime	High	General environment	- Tourist harassment and crime are at low levels but are increasing - *Some natural areas are not safe to visit*	- Declare Treasure Beach and Black River as resort areas - Consider pro-active strategies to head off and limit problems
Biodiversity conservation - general	High	General environment	Boat tours may affect biodiversity Biodiversity could contribute more to tourism	- Ensure carrying capacity is not exceeded - Develop new facilities
		Potential for ecotourism	- Lack of interpretive centres trails guidebooks guides	
Marine	High	Coral reefs	- No data which reefs suitable for diving or snorkeling or glass bottom boats - affected by pollution - may be affected by anchors - blasted to create boat channels and beaches	- Marine assessment - Pollution control strategy - Mooring buoys - Public education - Enforcement (BCA) - Regulations on use of the floor of the sea
	Low	Sea Grass	Cleared to make swimming areas - Damaged by anchors	- Public education - Regulations - Mooring buoys
	Low	Deep Sea	Potential for sport fishing not assessed	- Assess potential develop plans

Topic	Priority Level	Resources	Specific Issues	Suggested Actions
	High	Beaches	- High use beaches lack toilets and life guards Incompatible beach uses - beach erosion - sharks and rays may pose threat in some areas - threat to beach water quality from pollution - grazing animals on beaches - sand mining	- Assess and zone beaches - Provide facilities on beaches selected for high use - maintain tree cover - warn people about hazards - reduce pollution (tertiary sewage treatment control pollutants in river) - monitor water quality
	High	Beach front	- Removal of mangroves and coastal woodland reclamation of wetlands - Loss of beach access - Potential for hotel and villa development - Sewage impact from villas hotels	- Educate people about appropriate land use on beach front properties beach protection - Protect all remaining mangroves & replant - Consider encouraging citizens to collaborate in purchase of vacant beach front lots and manage them for conservation
Freshwater	High	Water sports	- Use of jet skis on rivers threatens wildlife - Sport fishing not regulated - Proposed water sport use of Wallywash and Pedro Ponds - Undeveloped potential (e g wind surfing) - River water unsuitable for bathing	- Develop and enforce policies and regulations for jet skis and sport fishing - require EIA for such operations - reduce river pollution
	High	Rivers - boat tours	- Carrying capacity may be exceeded - New enterprises not being excluded - Requirement for licences not observed - Tour boats from other areas (e g Treasure Beach) contribute to pressure - Tours not contributing to conservation - Feeding crocodiles could lead to crocodile attacks - Tours interfere with artisanal fishing - Tours encourage squatting/vending on banks (cheese rocks)	- Develop more comprehensive carrying capacity study and strict monitoring
Wetlands	High	Mangroves	- Dumping of solid wastes mars visual quality and makes trails unsafe - Clearance for tourism development - Mosquito spraying with Malathion	Control dumping - Protect mangroves Seek alternatives to spraying
Terrestrial	High	Coastal woodlands	- Clearance for coastal development	- Zone important area for protection Purchase important areas if necessary/possible

Topic	Priority Level	Resources	Specific Issues	Suggested Actions
Heritage and Culture	High	Black River Town	- Some plans no implementation need strategy godfather? Lack of appreciation of old buildings Lack of skills and knowledge and funds to repair buildings - Visual pollution	Develop strategy Designate buildings as necessary Develop skills *Clean up campaign*
		Taino sites	No inventory - Sites being destroyed	Inventory known sites - Try to get survey to find others *Develop regulations to protect sites* Voluntary emergency response team to record threatened sites?
		Other sites	- No inventory	- Do inventory (with UTech)
		Bamboo Avenue	- Excessive vending - Decline of bamboos - *Lost opportunities - what do visitors do when they get there?*	- Work with vendors association - restore bamboos - develop associated attractions with Lacovia
Physical Planning	High		- Lack of zoning in settlements - Lack of height regulations for construction - Lack of regulations for scenic roads / routes - Lack of regulations for open shorelines	- Develop zoning plans for special planning areas - height regulations Develop regulations for scenic roads
Administration		Attractions and facilities	- No mechanisms to support conservation	- User fees - Entrance fees - Licence fees - Leases Concessions
Finances	High	Tours	Local communities do not benefit directly or indirectly	Encourage private enterprise

Inappropriate and Incompatible Uses Several incompatible resource uses have been identified They include

1 High intensity tourism (e g hotels with more than 40 rooms) vs low density/ecotourism
2 High levels of crime vs low density/ecotourism
3 Use of mangroves or rivers as dumps vs tourism
4 Use of beaches as dance halls vs ecotourism
5 Use of a beach for tourism and fishing without zoning
6 Heavy industry (ports limestone mining) vs tourism
7 Scenic roads used for moving heavy cargoes by lorry (e g limestone)

Stakeholders The main stakeholders are small hotels villas and tour operators, local residents and government agencies (Table 5-5 2) Large national or international companies do not play a significant role in this sector

Legislative Framework The legislative framework provides comprehensive coverage for some groups of issues (such as *regulations* for large developments or tour operators) However there are many gaps in relation to *ad hoc* development and no managed resource protected area regulations (Table 5-5 3)

Table 5 5.2 Stakeholders in Tourism and Recreation

Government agencies Office of the Prime Minister TPDCo TCPA NRCA Port Authority River Rafting Authority St Elizabeth Parish Council South Coast Resort Board JNHT Police	Private businesses and companies In or near the area Hoteliers Villa Owners Restauranteurs Boat Tour operations Local tour companies Large and small land owners Cashoo Ostrich Farm YS Falls Apple Valley Outside the area Tour companies North Coast hotels Mandeville hotels
Local residents People who live in tourist areas Business people (shops gas stations etc) Small farmers Crafts people and vendors Fishermen Hustlers Taxi and minibus operators	NGOs and community-based organisations Treasure Beach Citizens Association PEDS SEEPA JHTA Others??

Table 5-5 3 Existing and Potential Regulatory Framework for Tourism in the Proposed Black River Protected Area

Theme	Law	Management Interests	Relevant Areas and Actions	Responsible Organization
Administration of protected natural and heritage areas and structures	NRCA Act	Declaration and management of protected areas	To be determined	NRCA
	Jamaica National Heritage Trust Act	Declaration and management of protected national heritage and monument	Various structures mostly in Black River	JNHT
	Public Gardens Act	Management of Public Gardens	Bamboo Avenue	Spt of Parks and Gardens
Integrated coastal resource management	Town and Country Planning Act	Development plans and orders sub-division approval	St Elizabeth Development Order	TCPD
	NRCA Act	Requires EIAs permits and licences for specified activities	Whole island	NRCA

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Table 5 5 3. Existing and Potential Regulatory Framework for Tourism in the Proposed Black River Protected Area

Theme	Law	Management Interests	Relevant Areas and Actions	Responsible Organization
	NRCA Act	Regulates discharge of liquid or solid wastes without licence	?	NRCA
	Beach Control Act	Regulates use of foreshore		NRCA
	Beach Control Act	Management of beaches	Designated Public Bathing beaches at Crane Road Parottee Thatchfield Fort Charles Treasure Beach	NRCA
	Harbours Act	Declaration of harbours control of discharge into harbours	?	Port Authority
	Local Improvement Act	Sub-division of lands stipulates that all buildings within one mile of sea must be approved by Beach Control Authority (NRCA)	Whole area specially one mile inland	St Elizabeth Parish Council
	Litter Act	Prohibits dumping in any public place or on private land without permission		
	River Rafting Act	Regulates commercial river rafting	None (Act does not apply to the Black River)	River Rafting Authority
	Public Health Act	Approves plans for waste disposal		
Pollution Control	NRCA Act	Prohibits discharge of waste without licence		NRCA
	Natural Resources Conservation (Permits and Licences) Regulations	Permitting system for pollution		NRCA

Table 5-5 3: Existing and Potential Regulatory Framework for Tourism in the Proposed Black River Protected Area

Theme	Law	Management Interests	Relevant Areas and Actions	Responsible Organization
	Trade Effluent and Sewerage Effluent Regulations Waste Discharge Fee Regulations	Sets discharge limits and user fees for waste treatment		
	Litter Act	Prohibits dumping		
	Noise Abatement Act	Regulates noise nuisances		
	Quarries Control Act	Establishes quarry zones controls licences for quarries (subject to environmental conditions)		Mines and Quarries Division
	Public Health Act	Broad powers relating to waste disposal in relation to public health		Ministry of Health
Planning and the built environment	Town and Country Planning Act	Development control		TCPD
Tourism and Recreation	Beach Control Act	Licencing of Life Guards		NRCA
	NRCA Act	Good conduct in listed areas		
		Construction on public recreational facilities		
	Jamaica Tourist Board Act	Regulation and licensing of dive boats boat tours tour guides attractions villas and hotels		Ministry of Tourism TPDCo
		Planning and control		South Coast Resort Board
	??			

Attractions The proposed Black River Managed Resource Protected Area like St Elizabeth as a whole has great potential for development of attractions Some of the existing and potential tourism facilities are summarized in Table 5-5 4

Beaches Existing beaches and their designated uses are listed in Table 5-5 5 The LME in consultation with the NRCA (as the Beach Control Authority) and the Parish Council may consider a more complete classification of bathing and other beaches in the proposed Black River MRPA The following classification system is suggested

Category I Full bathing facilities -- toilets changing rooms restaurants lifeguards beach parties on selected dates picnic shelters These (like Font Hill) would be leased to concessionnaires with a portion of the profits to the LME for overall protected area management

Category II toilets and changing rooms only (as inconspicuous as possible) and

Category III no development natural beach possibly with garbage bins and grills for cooking No parties or music Patrolled for safety and protection of wildlife Possible seasonal closure for peak turtle nesting etc

Table 5-5 4 Existing and Potential Attractions N b Existing attractions are shown in bold; attractions near the area but with close links are shown in square brackets

Nature tourism and interpretation	Visitor centres (Black River town) Story boards (selected trail heads and points) Watchable wildlife ponds (Black River town)	Hides (Great Pedro Pond Parottee Pond Upper Morass) Special interest tours (**birds** history natural history etc)
Recreation	Beaches and beach parks (three categories) Trails **Accommodation** (bed and breakfast villas small hotels in area and Mandeville) Special attractions canoe trips donkey trails recreational parks coastal boat trips **Boat tours**	**Sport Fishing** (river freshwater) River bathing Low impact water sports e g wind surfing Black River interpretive/craft center Crane Road Lacovia interpretive/craft center and trailhead Middle Quarters gateway village shrimp vending a viable attraction if cleaned up and made sustainable
Attractions	**Lovers Leap** Pedro Bluff Font Hill **Bamboo Avenue** Lacovia Tombstone	**Cashoo Ostrich Park** **(YS Falls)** **(Apple Valley)** **(Appleton Estate Rum Tour)** **Font Hill Beach Park** **Scotts Cove**
Health	Spas	
Culture	Historic Black River town Other historic structures	Heritage Trail Wrecks
Special events	**St Elizabeth Homecoming Week** **Great Bay Fishermens Week** **Black River Fishing Tournament**	**Hunting season** **Treasure Beach Triathlon**

Table 5-5 5 List of Bathing Beaches

Beach	Current Use	Current Designation			Current Condition	Proposed Classification
		F	B	H		
Scotts Cove	Fishing fish vending				Polluted but potentially good for bathing and diving	I
Font Hill Beach Park	Bathing		✓			I
Galleon Beach	Fishing bathing	✓	✓		Sea turtle nesting degraded by illegal sand mining	II
Crawford	Fishing				Highly eroded and polluted	III
Chocolatta Bay (?Hodges)		✓			?	
Black River (Crane Road)	Fishing bathing				Highly eroded used by villas	I
Crane Road Roundabout	Bathing		✓		?	II
Parottee	Fishing bathing	✓	✓		Heavy seagrass	II
Fort Charles		✓	✓		Illegal sand mining- now controlled?	II
Mahoe Bay					?	III?
Billy s Bay		✓	✓			II
Frenchmans Bay	Fishing bathing	✓			Unsafe dunes disturbed by trampling conflicts between fishing and bathing	I
Great Bay		✓	✓		Degraded by sand mining and erosion	I
Boatmans Bay					Unsafe	III
Calabash Bay	Fishing bathing	✓	✓		Eroded beach	I
Treasure Beach Hotel				✓		I

5-5 5 Action Plan

The Action Plan for Tourism and Recreation within the BRMRPA needs to be developed in the context of implementation of the draft Environmental Policy Framework and coordinated with the South Coast Sustainable Development Plan and the Tourism Master Plan However following declaration the objectives and standards (such as carrying capacity) developed for the BRMRPA will take precedence

This section suggests some priority actions N b Only the most important actions identified in Table 5-5 1–Specific Issues related to Tourism in Black River and Suggested Actions-- are discussed or listed below

Phase I - Immediate Short-term, Preparation for Delegation

The priorities for the initial phase will be to
- prevent further degradation of resources before protection by ensuring that the most important and threatened are provided with interim protection
- to develop mechanisms for promoting action in future
- to select one or two demonstration projects for immediate action The projects should be practical short-term and high profile
- to begin monitoring of important indicators

Prevention of Further Degradation of Tourism Resources This includes dealing with the complex issues surrounding the boat tours on the Black River as well as improving the current legal framework for development control in the proposed protected area Immediate actions could include protection of selected trees or scenic historical or biological importance (such as mangroves on Broad River the fig trees at the Black River Court House and the Buttonwood tree at Heron s Reef in Treasure Beach under Tree Preservation Orders)

Development of Mechanisms to Promote Sustainable Tourism in the Project Area The EPF and draft management plans will be reviewed (see Administration Sub Programme) During this process the need for additional legislation and regulations will be identified and work will begin on drafting

Demonstration Projects Also during the review phase the committees will be asked to identify some demonstration projects for which funding can be sought so that they can proceed as soon as possible

Monitoring NRCA begins monitoring programme starting with ???

Phase II - Delegation

Phase III - Implementation Action Plan

1 Adapt Local Legal Framework
Determine whether the national legal framework is adequate to regulate proposed activities and programmes and appropriate for area Specific issues include control of boat operators tour guides standards for visitor accommodation admission fees licences cesses and charges zoning of special development areas harmonization of architectural styles Regulations will have to be developed or amended as necessary

2 Conform with International Legal Framework
Ensure activities are consistent with Jamaica s international legal obligations

3 Maintain Biodiversity, Species, Resources and Functions
Ensure that proposed activities are consistent with programmes for protection and rehabilitation
Lobby for appropriate measures to support tourism (including reef inventory pollution controls protection and management of wildlife strategies for sustainable harvest see Natural Resources Management Sub Programme) Specific measures include evaluate reefs for tourism potential

- installation of mooring buoys
- identification of alternatives to aerial spraying of Malathion to control mosquitoes
- habitat management to increase wildlife populations around viewing areas
- ban feeding of crocodiles by tour boats seek alternative ways to attract them

4 Restore Depleted Resources
Seek new and innovative ways to use tourism to promote habitat and species recovery e g turtle-friendly tourism awards

5 Monitor Indicators
Develop indicators for tourism impacts and ensure regular data collection and analysis (see monitoring programme)

6 Develop Management Partnerships
Management partnerships will be needed with major stakeholders (see Table 5-5 3) probably including TPDCo attraction owners and operators and private land owners

7 Stimulate Research
Research that may be necessary to support this sector includes market research and carrying capacity studies (see Research Sub-programme)

8 Increase Public Education, Public Relations, Publicity and Awareness (See Public Education)
This will be an important element of the programme and will include materials designed for visitors (such as guide books maps, brochures), for developers and for attraction owners Types of materials include manuals for appropriate development, leaflets about regulations workshops for special groups signs etc

9 Develop and Regulate Visitor Attractions and Facilities
Address urgent issues relating to boat operations on the Black River

Develop at least one tourism or recreation project in each subarea (see subarea plans)

10 Extend SCRB Beautification Project
Stimulate expansion of the roadside planting program originally sponsored by TPDCo in the Southfield area especially using native species Consider starting a "most beautiful town or village' contest

11 Promote Training and Standards
Develop certification programmes for guides attractions and accommodation (green tourism awards or local equivalent) safety standards (insurances, guide lines equipment, training)

5-6 POLICY, LEGISLATION AND ENFORCEMENT

5-6 1 Introduction

A summary of the framework of international treaties, laws regulations and policies that govern or affect the proposed Black River Managed Resource Protected Area is laid out in Chapter 3 (Section 3 1) This sub-programme addresses this framework in somewhat greater detail and considers the activities required for more effective legal protection, improved compliance and improved enforcement

5-6 2 Vision

A protected area in which all applicable laws work in harmony for the protection and improvement of the area and are understood respected and effectively implemented and enforced by all for the benefit of all

5-6 3 Existing Conditions

International Conventions The most relevant international conventions summarised in Chapter 3 are being implemented with growing diligence but with insufficient coordination and strategic focus

Laws The existing regulatory framework for the area is complicated by the large number of laws many with overlapping powers which are administered by more than 15 agencies in five ministries

Regulation and management are largely carried out by government organizations that have statutory responsibilities for resources and resource management These are summarized in Table 5-6 1 and laid out in greater detail in Annex B)

Several of the most important pieces of legislation are currently under review and are expected to be amended or replaced shortly These include the Fishing Industry Act and the NRCA Act

Regulations Regulations are gradually being added to elements of the NRCA Act to make the Act more operational Drafting instructions for regulations for Managed Resource Protected Areas and other types of protected areas are in preparation

The Permit and Licence System introduced on January 1, 1998, is a potentially powerful tool for ensuring that any residential, commercial, tourism and ecotourism projects in or affecting the proposed Protected Area are comprehensively reviewed in terms of their direct indirect and cumulative impacts

Policies The growing body of policy being developed by NRCA provides essential guidance to the Parish Council the future LME and others involved in the future protected area The NRCA will benefit from active participation in review Some of the most relevant policies are listed in Table 5-6 2

The policies and management practices of large public and private land owners (Table 5-6 3), many of which act virtually autonomously, also have significant effects on the current future state of the area

Compliance and Enforcement Primary reasons for degradation of the environment in the proposed Protected Area are inadequate enforcement and inappropriate sentencing While the preferred approach of the NRCA in general and the Protected Areas System in particular is voluntary compliance effective enforcement is an essential accompaniment to achieving compliance

Individuals at every level of income and education are involved in the illegal harvesting of protected species, with cumulatively disastrous effects The draft EPF cites the slaughter of turtles as an example of disregard of environmental laws and the light fines imposed as an example of the low level of environmental knowledge and consciousness among the judiciary Bird shooting restrictions are also inadequately enforced (See draft EPF pp 73 and 75) The draft EPF notes the full range of illegal activities including theft of lumber destruction of mangroves dumping and filling in wetlands, and illegal sandmining that proceed without apparent notice or restriction

Table 5-6.1 Summary of Main Sectoral Responsibilities for Regulation and Management of Black River and its Resources

SECTOR	LEGAL AND MANAGEMENT INTERESTS
Administration of actual or proposed protected areas	NRCA Forestry Department JNHT PCJ Superintendent of Public Gardens Commissioner of Lands Private land owners NGOs
Biodiversity conservation	NRCA Forestry Department JNHT NRCA s advisory committees (sea turtles crocodiles)
Integrated Coastal Resources Management	TCPD NRCA St Elizabeth Parish Council Land Utilization Authority Fisheries Division Port Authority?
Water Resources Management	WRA NWC NRCA Forestry Department Division of Mines and Quarries River Rafting Authority (if Act is amended) PWD Ministry of Health BRUMDEC
Pollution Control	NRCA Port Authority? Division of Mines and Quarries Ministry of Health St Elizabeth Parish Council BRUMDEC?
Tourism and Recreation	Ministry of Tourism (TPDCo South Coast Resort Board) NRCA
Agricultural Resources	Ministry of Agriculture (RADA)

Table 5-6 2 Selected GOJ and NRCA Policies

	TITLE	STATUS
1	Towards a National System of Parks and Protected Areas	White Paper
2	Towards a Beach Policy for Jamaica	Green Paper
3	Watershed Policy	Draft Green Paper
4	Coral Reef Protection and Preservation Policy and Regulation	
5	Mangrove and Coastal Wetlands Policy and Regulation	
6	National Policy for the Conservation of Sea Grasses	
7	National Mariculture Policy	
8	Guidelines for Marinas and Small Boat Harbours	
9	Guidelines for Deployment of Shoreline and Benthic Structures	
10	Guidelines for Coastal Dredging	
11	Protected Areas Guidelines	
12	Jamaica Coral Reef Action Plan	
13	Sea Turtle Recovery Action Plan	
14	Crocodile Action Plan	
15	National Environmental Action Plan for Sustainable Development	

At the other end of the scale the activities of several large stakeholders have severe adverse impacts on the proposed Protected Area even though their operations are outside it These include Appleton Estate Alpart and the owners of the lime facility at Maggotty all of which significantly impair the quality of the rivers the morass and the viability of the natural resource based economy

Efforts to conclude an agreement with Appleton to control the release of dunder to the Black River system have so far been unsuccessful The fact that no action has been taken on either side after so many years (since determination of the source of pollution in 1997 and especially since enactment of the NRCA Act in 1992) has been indicative of a lack of will to protect the unique value of the Morass

Table 5-6 3 Some of the Large Landowners in the Proposed MRPA

LAND OWNERS	HOLDINGS
Government of Jamaica	Black River Lower Morass (currently vested in PCJ) Black River Upper Morass (Ministry of Agriculture) Font Hill (PCJ) Forest Reserves at Bogue and Yardley Chase
Jamaica Broilers	Aquaculture (Newton)
Beres Suberan	Biscany (western Upper Morass)
Various	Owners/lessors/squatters on upper morass (includes sugar and fish farms) Coptic Church?
Mr Panton	Cashew property
West Indies Glass	Hodges
Malcolm Bay Ltd	Malcolm Bay
Dr Bennett and	Galleon Bay
Mr Hendricks and Mr Parchment	Parottee Ponds and Point
Dr Bennett and Mr Austin Levy	Thatchfield property
Mr James	Great Pedro Pond
Mrs Gilpin	Great Pedro Pond and Pedro Bluff

There is currently one NRCA Conservation Officer assigned to the parish who covers the area by motor-cycle In addition, since July 1998 an NRCA Environmental Warden and a boat have also been assigned to patrolling the Black and Broad Rivers, implementing a recommendation of the Black River Carrying Capacity Study

These human resources are insufficient to provide the needed level of surveillance, interpretive communication and enforcement Enforcement of environmental laws and regulations by other enforcement officers (JCF, Coast Guard, JDF) is infrequent

5-6 4 Desired Outcomes

Through review and implementation of the EPF and the Protected Area Management Plan, the people of St Elizabeth and other stakeholders in the parish and proposed Protected Area can contribute significantly to more effective regulations compliance and enforcement

Through this Sub-programme and the Education Sub-programme, there should be a greater recognition of the need for improved compliance and enforcement, and a more complete and effectively implemented legal and regulatory framework

5-6 5 Recommended Actions

5-6 5 1 Review/Implement International Legal Framework for Conservation

1 1 Expand Ramsar site The NRCA should apply to the IUCN for expansion of the existing Ramsar site to cover the Upper Morass and consider applying for Ramsar status for Great Pedro Pond

1 2 Review SPAW Protocol Suggest changes if necessary and identify needs for improved implementation of its requirements by GOJ agencies (see Table 5-6 4) Consider means to improve compliance with(such as proper provision for sewage and solid waste for example)

1 3 Adhere to Sea Turtle Conservation Convention

Table 5-6 4 Obligations under International Treaties

	Compliance at the National Level	Compliance in the Proposed Black River MRPA and Surroundings
The **SPAW Protocol** (Article 6) requires signatories to "establish appropriate and effective planning and management regimes for protected areas including		
• the formulation of management guidelines for the areas	Completed	To be refined over time for the MRPA
• the adoption of management plans	3 examples to date	This draft in process/review
• the active involvement of local communities in the planning process	Effective in existing PAs	Much more outreach required
• the undertaking of scientific research and monitoring of the areas	Beginning	Little as yet (WIWD is an example)
• the promotion of public awareness programmes for users of the protected areas	Being developed and implemented in existing PAs	Initiated
• the establishment of mechanisms to adequately finance the management and development of the areas and the provision of qualified managers and technical personnel '	Being developed	To be developed
The **SPAW Protocol** (Article 5)obligates signatories to take measures consistent with national and international law to ensure that the objectives for which the protected areas are established are achieved Such measures should include		
• The regulation or prohibition of dumping or discharge of wastes and other substances that may endanger the protected area	Inconsistently enforced	Not enforced
• The regulation or prohibition of coastal disposal or discharges causing pollution	Inconsistently enforced	Not enforced
• The regulation or prohibition of various activities such as hunting or fishing of endangered or threatened species of fauna and flora and their parts or products	Inconsistently enforced	Inconsistently enforced
• The regulation of trade in and the importation and exportation of endangered or threatened species	Enforced	Not enforced
• The regulation or prohibition of industrial activities and other activities which are not compatible with the designated uses to which the areas may be put	Inconsistently enforced	Not enforced
• The regulation of tourist and recreational activities that may endanger the ecosystems of protected areas or the survival of threatened or endangered species of flora and fauna	Inconsistently or inadequately enforced	Not regulated

The **Biodiversity Convention** (Article 8) requires signatories to		
• Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity	System is being expanded	Proposed MRPA is a major step towards compliance
• Develop, where necessary guidelines for the selection establishment and management of protected areas where special measures need to be taken management of protected area or areas where special measures need to be taken to conserve biological diversity	Completed	Proposed zoning of MRPA aims to meet this requirement
• Regulate and manage biological resources important for the conservation of biological diversity whether inside or outside of protected areas with a view to ensuring their conservation and sustainable use	Completed for several specific species	This draft Management Plan is designed to meet this requirement
• Promote the protection of ecosystems natural habitats and the maintenance of viable populations of species in natural surroundings	Completed for several specific species	This draft Management Plan is designed to meet this requirement
• Promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas	Measures not yet sufficient or reliable	The draft EPF aims to meet this requirement
• Rehabilitate and restore degraded ecosystems and promote recovery of threatened species inter alia through the development and implementation of plans or other management strategies	Some replanting projects beginning but research into restoration needed	Draft Management Plan contains programmes
• Develop and/or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species	Fairly comprehensive	To be reviewed
The **CITES Convention** states that Among the matters which must be addressed when a site is being considered for declaration as a protected area is		
• whether and the extent to which species of flora and fauna existing at that site fall within any of the three CITES categories of endangered species	Always addressed prior to declaration	Proposed MRPA known to have high levels of endangered species
• to the extent that they do the regulations and management plan relevant to the protected areas must be developed in a manner which is consistent with CITES and supportive of its objectives	Existing regulations and species management plans consistent with CITES	Additional regulations and refined management plans may be required (See Chapter 7 for summaries)

5-6 5 2 Develop National Regulatory Framework for Protection and Management

2 1 Revise draft Black River MRPA boundaries to reflect changes (i e inclusion of Font Hill Thatchfield Treasure Beach and Lovers' Leap)

2 2 Participate in review of proposed new Fisheries Act and apply new regulations to the protected area as necessary

2 3 Review draft regulations for Managed Resource Protected Areas to ensure that they can work in this area This is an important opportunity to help the drafting counsel to develop practical effective regulations by working on a real example

2 4 Review existing legislative, regulatory and management framework for Black River Lower Morass

2 5 Use existing laws and regulations to achieve goals Review implications of existing protected areas in the proposed protected area (including Forest Reserves Conservation Areas declared under the Development Order Game Sanctuaries and Reserves) and determine how they can best be harmonised with proposed zoning and sub-area plans Examine whether other legislation (such as Tree Preservation Orders can be used in the short term to provide immediate protection (e g to swamp forests, mangroves on Broad River) until protected area regulations can be implemented

2 6 Develop additional regulations as necessary Determine whether additional types of regulations will be needed to facilitate management or whether objectives can be met through internal planning Special attention should be paid to ways of achieving conservation objectives on private land Suggest revisions to species legislation as necessary Promote needed new and amended legislation and regulatory tools listed in Table 5-6 5

5-6 5 3 Develop Protected Area Policy Framework

3 1 Assemble and review the policy and guidelines framework for the proposed protected area Ensure all proposed actions are consistent with NRCA s policy documents (e g beaches mangroves etc) and other applicable GOJ policy documents

3 2 Work with other policy-making organizations to ensure that they area aware of the protected area policies and to harmonize the protected area policies with their policies (including housing infrastructure tourism industrial development mining agriculture and fishing)

3 3 Over time, based on local experience recommend new or refined policies and develop refinements and/or additions to existing protected area guidelines specific to the needs of the Black River MRPA

5-6 5 4 Immediate Actions - NRCA Lead

4 1 Minimise Preemptive Action Once the intention to declare a protected area has been declared there is a risk that some people may feel threatened and may try to implement plans before the area is declared Effective enforcement of planning regulations and other existing laws is essential in the start-up phase The area conservation warden should be asked to take the lead

4 2 The NRCA and WRA are resuming their efforts to achieve success with Appleton They need to conclude a satisfactory agreement in the very near future The WRA and JBI continue to work with Alpart to address the issue of Essex Valley and Black River system pollution Both situations should be the subject of Cooperative Agreements which should be regarded as binding legal documents

4 3 The NRCA should begin its proposed program to raise the environmental awareness of the judiciary

4 4 A vehicle would expand the effectiveness of the Conservation Officer and wardens The availability of a vehicle would extend his effectiveness and should be a priority budget item for the Protected Area management

5-6 5 5 Enforcement

5 1 The Conservation Officer and Environmental Warden already active in the proposed Protected Area should be joined by at least three additional NRCA Environmental Wardens one to reinforce the existing river patrol, one to patrol the beaches and dunes and one to patrol other parts of the protected area regularly and on call

New wardens should be recruited as far as possible through advertisements in the proposed Protected Area

5 2 In addition to standard NRCA/Ministry training, the new wardens should receive a special orientation to the objectives for and conditions in the proposed MRPA and should participate in local educational and interpretive programmes (see Chapter 5-7 Education Sub-programme)

5 3 The Conservation Officer and all wardens should be given District Constable powers (of arrest) Enforcement needs to focus on illegal sand mining, illegal fishing practices (especially dynamiting) illegal cutting, collecting or harming of swamp and riverine forest trees mangroves, heritage trees such as guangos and protected species of flora, illegal bird shooting, and dumping and filling of wetlands

5 4 General law enforcement will be accomplished by the Jamaica Constabulary Force and its subsidiary components including the Marine Police The Jamaica Defence Force and Coast Guard will exercise its responsibilities including enforcement of drug laws in collaboration with the police However wardens should undertake at least occasional patrols with other enforcement officials

5 5 The Police should be represented on the LME Board and/or LAC and Police personnel should participate in training, educational and interpretive programs whenever possible

5-6 5 6 Compliance

As outlined in the NRCA s March 1998 "Guidelines for the Management of the Protected Areas of Jamaica the LME will need to take steps to encourage informed compliance including

6 1 Clear posting of laws and boundaries

6 2 Encouragement of self policing education in schools, environmental education programmes for the general public and visitors contact of community based organizations and compliance demonstrations (see Chapter 5-7)

6 3 Building community empowerment through such methods as the appointment and training of Honorary Game Wardens Designated from the community, these wardens may be used to inform peer groups and show how to conform to laws and regulations by doing

Recommended actions are summarized by phase in Table 5-6 6

Table 5-6 5 Recommended New and Amended Laws and Regulatory Tools and Practices

TOPIC	ISSUE	NEEDED LEGISLATION OR REGULATION	LEAD	NEEDED PRACTICE	LEAD
DEVELOPMENT CONTROL					
1 Conservation on Private Land - large and small landowners	Provide incentives for conservation or modified development e g clustering for protection of watershed areas habitat views etc Provide incentives for management of carrying capacity of private eco-tourist attractions limiting access to highly sensitive areas etc	Enabling legislation for conservation easements or other forms of property tax relief	MEH	Improved tax collection	MOF
				Make project review (EIA) and approval process more independent comprehensive proactive and participative	MEH NRCA TPD PC
	Require environmental assessment of single structures in critical areas	*Clause(s) in MRPA Regs Tied to* recommended zoning	NRCA	Provide early advice on environmentally-appropriate site planning	PC TPD NRCA
	Remove pressure to clear valuable natural vegetation	Amendment of idle lands policy	MEH LUDC	Develop land suitability data base	NRCA
2 Conservation on Public Land	Improve coordination and review of proposals for development		MEH	Develop land suitability data base	NRCA
3 Scenic Routes	Protect the visual quality of road and water routes important to development of expanded tourism	Scenic routes enabling legislation or add to NRCA Act Protected Areas regulations and TCPA Act	MEH NRCA *TPD*	Visual corridor surveys and controls in EIAs and *Devt Orders*	NRCA TPD
4 Tree Preservation	More effective protection required	Review Tree Preservation Order law and process including penalties and replanting requirements	TPD		
5 Protected Areas	Regulations for MRPAs and 3 other IUCN types of protected areas needed	Drafting of Regulations in process	MEH NRCA		
6 Interim Protection	Power to apply moratorium needed during PA review / declaration process	Section 33 of the NRCA Act provides for emergency action by the Minister Could be used as an interim control?	MEH		

BIODIVERSITY PROTECTION					
7 Riparian Buffers	Setbacks from rivers and wetlands are required for safety effective drainage/flood control and protection of important vegetation	Establish a range of standards and include in Watershed Protection Act?	MEH NRCA	Require appropriate setbacks as part of the development plan and development review process	NRCA TPD
8 Rare Plants	Except through CITES rare and endangered pant species have insufficient legal protection	Rare and Endangered Plant Protection Act (amendment or complement to Wild Life Protection Act) or WLPA regulations	NRCA		
9 Sustainable Harvest	Inadequate protection of endangered species from hunting	New regulations required?	NRCA	Improved enforcement of bird shooting limits endangered species destruction and more effective sentencing	NRCA Judic-iary
TOURISM					
10 Improvement of Tour Boat Operations	Unlicensed boat operators carry tourists	Legislation requiring all boat operators or fishermen carrying tourists to be licenced following approved training in life saving and navigation and equipment inspection	MOT MOA	TPDCo training could be supplemented by the LME with training in tour guiding and interpretation	TPDCo FD LME
11 Tourism Project Review	EIAs required for all ecotourism projects but not tourism projects	Amend Permit & Licence System to add tourism to the list of project types requiring EIA	NRCA	Make project review (EIA) and approval process more independent comprehensive proactive and participative	NRCA other GOJ
CULTURAL RESOURCES					
10 Archaeological Sites	Sites being destroyed wantonly and by improperly researched development projects	Legislation needed to require site assessment and survey in areas with potential for pre-historic sites and set penalties for wanton destruction	NRCA TPD	Penalties for destruction need to be applied effectively	Judic-iary

Table 5-6.6 Recommended Action Plan			
	START UP	DELEGATION	IMPLEMENTATION
1 0 REVIEW INTERNATIONAL LEGAL FRAMEWORK FOR CONSERVATION			
1 1 Expand Ramsar Site to Upper Morass and add Great Pedro Pond (NRCA)	x		
1 2 Review SPAW Protocol and local compliance (LME / PC / GOJ)		x	x
1 3 Adhere to Sea Turtle Convention (NRCA / LME)	x	x	x
2 0 DEVELOP NATIONAL LEGAL FRAMEWORK			
2 1 Revise draft boundaries (NRCA)	x		
2 2 Participate in review of new legislation (NRCA / local organisations / LME)	x	x	x
2 3 Participate in review of new regulations (NRCA / LME)			
2 4 Review existing regulatory framework for Black River MRPA (LME)		x	x
2 5 Use existing laws to achieve goals		x	x
2 6 Identify/describe additional regulations as necessary (NRCA / other GOJ agencies / LME)			x
3 0 DEVELOP PROTECTED AREA POLICY FRAMEWORK			
3 1 Assemble and review policy framework for Black River (local organisations / LME)	x	x	
3 2 Publicise policies and guidelines (LME)		x	x
3 3 Revise and add to protected area guidelines (LME / member organisations)			x
4 0 IMMEDIATE ACTIONS			
4 1 Minimise preemptive action (NRCA)	x		
4 2 Conclude cooperative agreements with major polluters (Appleton Alpart) (NRCA WRA)	x		
4 3 Begin environmental sensitisation programme for the judiciary (NRCA)	x		
4 4 Assign vehicle to NRCA staff in MRPA (NRCA)	x		

5 0 ENFORCEMENT			
5 1 Appoint at least three new Environmental Wardens to prevent further degradation of resources	x		(x)
5 2 Train wardens (NRCA / LME)	x	x	(x)
5 3 Obtain District Constable status for wardens	x		
5 4 Encourage joint patrols with other law enforcement bodies		x	x
5 5 Seek police representation on LME board and/or LAC	x	x	x
6 0 COMPLIANCE			
6 1 Develop signage program posting boundaries and principal regulations (LME)		x	
6 2 Encourage self-policing etc (LME)		x	x
6 3 Build community empowerment			x

5-7 PUBLIC EDUCATION, PUBLIC RELATIONS, PROMOTION AND INTERPRETATION

5-7 1 Introduction

The parish-wide survey of environmental awareness conducted in late 1996[1] produced findings which are of fundamental importance in planning a program of public education for Black River These findings which clearly point to the need for a greater body of information about the environment to be communicated to residents, are summarized in Table 5-7 1 Based on the survey, there is no question that residents would like more information as a means of enhancing their level of knowledge about the environment and better fitting them to contribute to the process of sustaining and maintaining the environment

Tourists learn in a rather 'hit and miss' manner about the environment they are visiting, depending upon the knowledge and communication skills of the guide They may even been given erroneous information or observe practices (such as steering tourboats close to crocodiles and nesting birds) that are environmentally unfriendly

5-7 2 Vision

All elements of the society of stakeholders dependent on or otherwise concerned about the Black River Morass and related coastal region will share at least a basic understanding of the special importance of the ecosystems and the benefits of and mechanisms for protecting and restoring them Visitors will leave the area with at least an appreciation of its riches some accurate information and a thirst for more on the next visit

5-7 3 Purpose

This sub-programme will create the conditions for the success of all other programmes by encouraging stakeholders to commit themselves to supporting it actively

[1] Report on the Environmental Awareness Survey of the Black River Area Market Research Services Limited for TSS Inc July 1997

5-7 4 Desired Outcomes

The main outcomes will be

- Maximum public participation in decision-making
- Public support for parks and protected areas
- Encouragement of advocacy for environmental causes
- Active support for environmental programmes (voluntary help)
- Increased compliance with environmental laws and good practices
- Increased understanding of environmental issues
- Promotion of appropriate local and foreign tourism

5-7 5 Strategy/Approach

Public education public relations, promotion and interpretation can be grouped because they are likely to be carried out by the same persons or group of persons, sometimes using the same media However, they are separate programmes with separate objectives

5-7 5 1 Public Education

This refers to a general improvement in the level of knowledge of the general public or specific target audiences Two main types of information are communicated

- "Need to know information includes topics pertaining to regulations closed seasons incentives etc , that the audience needs to ensure that they change their behaviour to comply with laws ensure personal safety or take advantage of opportunities
- "Nice to know' information includes things that are of interest to citizens but do not necessarily require a change of behaviour, such as the status of coral reefs globally or in Jamaica

Providing audiences with adequate Nice to know" information often makes them more receptive to "Need to know' information and helps to general support School programmes often focus on Nice to know' information with the long-term objective of creating a more environmentally-aware audience when the children grow up

Table 5-7 1 Views of Residents about the Black River Environment

- Information provided by residents of the St Elizabeth area does not convey a sense that they fully understand what the word environment really means
- Residents are convinced that environmental issues or at least issues to do with sustaining or maintaining the environment are not within their power to change There is a certain feeling of helplessness to do anything positive about the environment
- Residents of the area have a definite inclination to learn more about the environment and to become part of a group or groups seeking to bring about change At the same time, they recognize that they are not fully equipped or knowledgeable enough to work independently on environmental projects
- Television and radio are the principal media sources of environmental information A relatively small number of residents source such information through newspapers The prevailing view is that more brochures, flyers public fora and seminars are needed to enhance knowledge
- The state of the economy, unemployment and education are ranked as the key issues affecting St Elizabeth and the Black River area in particular While environmental problems may not be the principal concern of all residents still recognize the degree of importance attached to these issues and claim they are aware that there are groups for whom this is the critical area of focus
- Very little is known about the activities of the NRCA with regard to efforts to bring about environmental change Farmers and environmentalists, the tourist board and tourist themselves are felt to be the agencies primarily concerned about environmental matters
- Strong positives are associated with the Black River Morass which residents feel generally has the potential to realize significant benefits for the people living in and around it and in the parish as a whole Principal economic benefits have to do with its fishing and to a lesser extent its farming capabilities From an environmental position the morass is highly regarded as a habitat for marine life and wildlife and as a tourist attraction
- Despite its acceptance as a positive for the area there is the general feeling that the morass should be drained to real with the problem of mosquitos that plague the area and to make it more viable for the pursuit of agricultural opportunities

Specific objectives of the Black River public education programme might include

- Ensuring that citizens are aware of the new protected area its boundaries and objectives,
- Ensuring that people are aware of the existing laws and new regulations (e g pertaining to any special management areas for sea turtles) and support them (e g , by providing information about the global plight of sea turtles and their ecological importance),
- Sensitizing judges about the importance of environmental offences and penalties
- Encouraging people to participate in review meetings for the EHF Citizens' councils and user groups (e g by providing a local newsletter about activities, getting national media coverage for specific events),
- Increasing general and specific awareness of relevant issues e g by supplying articles about wetland conservation, coral reefs in general or Black River in particular, to the national media and to selected individuals and groups or by providing leaflets about specific issues (such as wetland fires lumber extraction) to community groups,
- Sensitizing decision-makers about the importance of the protected area,
- Selecting a flagship species for the protected area (West Indian Whistling Duck should be considered)

5-7 5 2 Public Relations

This is the art of generating support for institutions and programmes It involves the creation of a positive image of the protected area, through a variety of means It is essentially more focused on events than the general public education programme Troubleshooting is likely to be an important element of the public relations programme

Specific examples of the public relations programme might include

- Ensuring as many as possible representatives of stakeholders groups are invited to relevant meetings and that everyone feels that they have had a chance to be heard
- Implementation of a schools programme to ensure that the next generation of citizens will support the protected area
- Promoting and participating in special events that are consistent with the objectives of the protected area (e g the St Elizabeth Homecoming Fishing Tournaments)
- Winning the support of the groups whose interests may be affected by the proposed protected area such as tour boat operators on the Black River
- Involving stakeholders in decision-making e g through the formation of user councils and advisory councils, maintaining their functions (writing and circulating minutes scheduling meetings implementing decisions) is essential but time-consuming,
- Winning community support by using protected area programmes to provide for their needs (e g better roads, community centres employment) It is important to listen to the community and determine their needs and priorities, and
- Involving community members and visitors in voluntary actions, e g beach cleanups education programmes tree planting data collection (e g reports of sightings of threatened species, bird counts, incident reports)

5-7 5 3 Promotion

Promotion is essentially advertizing The protected area and its partners and stakeholders are likely to generate a variety of products and services that will require promotion These may range from craft goods using cultivated materials approved tour operators or guides turtle-friendly tourist resorts approved bed and breakfast stops to the heritage trail, nature trails and interpretive centres Another category of activities might include pro-active planning advice for developers in the concept phase A wide variety of materials, including leaflets, brochures and advertisements will be needed

5-7 5 4 Interpretation

The interpretation plans for specific sites are likely to include interpretation centres special exhibitions activity programmes for school groups sign boards boundary signs and markers information about how to behave what to see as well as trained tour guides and educators

Each subarea will require its own interpretive programme which is likely to include at least one interpretive centre on Crane Road for the Lower Morass Elim pumping station for the Upper Morass Great Pedro Pond Pedro Bluff and Lovers Leap for Treasure Beach and at sites to be determined for the other areas Interpretive centres provide highly visible attractive and interesting focal points At least one should be built as early as possible in the project

5-7 6 Action Plan

This is a very large and important sub-programme It is very easy to create shopping lists of desirable activities very difficult to identify and focus on the most essential ones At the outset the programme should emphasize the steps that are essential for delegation especially the public review of the EPF and the draft management plan This will probably take at least six months depending on the resources available

The structure and priorities for the balance of the first five-year plan are expected to be clarified in the course of this process

Table 5 7.2 Stakeholders in Public Education, Public Relations and Interpretation

Government agencies	Local residents	NGOs and community based organisations
NRCA - Public education	Resource User Groups	SEEPA
NRCA - Coastal resources	– Fishermen	CDF
NRCA - National parks and wildlife	– Shrimp fishermen	JJN
Ministry of Education	– Shrimp higglers	4H
Local schools and colleges	– Thatch craftspeople	—
Jamaica Tourist Board	– Farmers	—
TPDCo	Special target audiences of various types	
SCRB	– Primary school children	Private businesses and companies
—	– High school children	Boat Tour operators
—	– Community College and Teachers Training College students	Cashoo Ostrich Park
		PCJ and Concession holders
	– Teachers	Developers
	– Service Clubs	—
	– Churches and Ministers Fraternal	—
	–	
	–	

Table 5-7 3: Draft Action Plan for Public Education, Public Relations, Promotion and Education

ACTIVITY	START UP	DESIGNATION	IMPLEMENTATION
1 Design public education public relations promotion and interpretive programmes (in three phases)	X	X	X
2 Assign responsibility for design Phase 1 - NRCA staff Phase 2 -3 - LME staff	 X	 X	 X
3 Assign responsibility for implementation Phase 1 - NRCA staff Phase 2-3 - LME full-time staff officer Volunteers Partnerships	 X	 X	 X X
4 Train NRCA staff and ME officers (topics include dealing with the public running meetings conflict-resolution, public speaking, writing for the media and programme design)		X	X
5 Public Education - Improve compliance by informing public about changes in regulations and laws, and the importance of international conventions - Educate judges about the importance of appropriate sentencing for environmental offences - Develop and disseminate guidelines and regulations for resource use in the Conservation Area - Develop incentives for good resource use (awards, competitions, manuals seals of approval for sites companies hotels and companies) - Promote broad community awareness – Mount general media campaign – Fora, exhibitions, seminars special events (e g fishing weeks tournaments, St Elizabeth Homecoming) – Media coverage and reports – Signs posters and brochures - Select and promote a flagship species (West Indian Whistling Duck)	 X X X X X	 X X X X X X	 X X X X X X

6 Public Relations			
- Keep stakeholders informed and involved			
– Review EPF and draft management plans	X		X
– Form and manage user groups and committees	X	X	X
– Hold special workshops and events (e g beach clean ups)		X	X
– Form LAC and hold regular meetings		X	X
- Win support from decision-makers large stakeholders key players			
- Develop and massage one-to-one contacts	X	X	X
- Work with school children			
– Teacher training			X
– Junior Warden programme			X
- Special events (Earth Day World Wetlands Day World Environment Week National Wood and Water Day etc)			X
– Visits and presentations			X
– Respond to requests for talks exhibitions etc			X
– Competitions			X
– Materials (posters worksheets, videos etc)			X
– Field trips			X
– Schools programmes at interpretive centres			X
- Win community support by helping them deal with issues (such as road repairs water supplies security)			
- Develop volunteer programme (e g beach clean ups, bird counts)			
7 Promotion			
- Promote LME		X	X
- Promote tourism (e g through media visits brochures advertising tourist information centre)			X
8 Interpretation			
- Design and construct manned and unmanned centres story boards, signs nature trails other trails boardwalks hides		X	X X
- Train tour guides (site specific)			X
- Design relevant material			X

Tables 5-7 4 and 5-7 5 provide menus of materials to be produced and techniques for disseminating and soliciting information to and from resource user communities politicians, government agencies Black River merchants and visitors These materials and techniques will require careful selection according to the audiences being targeted

Effective community outreach organization, behavioral change and research and monitoring among many smaller communities in the area will require the sensitive application of Participatory Rural Appraisal techniques (see Participatory Rural Appraisal Manual, NRCA-DEMO March 1997) The latter emphasize consultation with and observation of those who are dependent on the area's natural resources in the places where they live and work Application of the techniques requires a understanding of the following fundamental principles

- The facilitator s role is as catalyst and collaborative analyst not leader of the discussion
- Sustained contact with communities is vital,
- Communities are not monolithic but divided into indistinct and overlapping groups Facilitators must be aware that several politicized agendas may (co)exist,
- Reality can only be understood from several perspectives simultaneously,
- Personal qualities, such as sensitivity intuition and integrity, are important in facilitators,
- Local people must reach their own decisions themselves,
- The facilitator needs to hand over the pen (or pencil chalk or stick for drawing in the sand) to the participants

In the case of education outreach, decision making and behavioral change in more accessible communities and urban settings there is a variety of additional techniques available These can be used to focus attention on and facilitate decisions about the architectural quality of Black River the future patter of growth of the town and other communities and approaches to improving the economy and the quality of life

Table 5 7 4 Some Types of Educational Materials to Be Produced

Printed Materials
- Design and print a brochure for the MRPA
- Produce a monthly newsletter
- Provide thematic information to community leaders, decision makers and organized user groups
- Provide materials to periodicals and publications
- Provide information to businesses about resources and activities
- Distribute educational materials at boat tour moorings
- Produce leaflets on rules and regulations (e g rules, regulations and etiquette for boats on river)
- Produce guidelines for specified developments
- Produce guidelines for property owners, e g preventing beach erosion, turtle friendly tourism
- Produce fact sheets for distribution to JTB
- Provide information about environmentally safe practices
- Produce an environmental atlas of the MRPA
- Produce worksheets for children
- Produce bird checklists
- Produce annual reports (including summary monitoring data)

Audio-Visual Materials
- Establish an audio and visual library
- Produce audio and visual tapes on special themes

Signs/Displays/Exhibits
- Establish wayside exhibits throughout the area
- Establish a mobile display

Promotion
- Establish a visitor centre in Black River
- Establish display boards/information kiosks (with donation box) at major airports

Table 5 7 5 Types of Events and Techniques for Soliciting/disseminating Information

Action Planning Event
Carefully structured collaborative event at which all sections of the local community work closely with independent specialists from all relevant disciplines to produce proposals for action

Activity Mapping
A way of getting people to plot how they use places as an aid to understanding how best to improve them. (Also used less formally in Participatory Rural Appraisal)

Awareness Raising Day
Day of activities designed to promote interest in an urban design issue, normally held prior to a planning day or other intensive activity

Briefing Workshop
Working session of users and professionals held at an early stage in a building or planning project to design a project

Capacity Building Workshop
Event organised primarily to establish partnerships between the public private and voluntary sectors on development issues

Community Appraisal
Survey of the community by the community to identify needs and opportunities Also referred to as a Community Audit or Rapid Rural Appraisal.

Community Plan
Plan for the future of a community devised by local community interest groups

Community Planning Forum
Multipurpose session lasting several hours designed to secure information generate ideas and create interaction between interest groups.

Community Projects Fund
Fund for making grants to community groups for employing professionals to undertake feasibility studies on environmental projects

Development Trust
Independent not-for-profit organization controlled by local people which facilitates and undertakes physical development in an area (such as Kingston Restoration Company)

Elevation Montage
Display technique for helping people to understand and make changes to streetscapes and public spaces.

Forum
Non-statutory body for discussing a neighborhood's affairs and acting as a pressure group for improvements

Future Search Conference
Highly structured two and a half day process allowing a community or organization to create a shared vision for its future

Guided Visualization
Group process using mental visualization techniques for establishing a community s aspirations

Neighborhood Planning Office
Local office established to co-ordinate community planning activity

Open House Event
Event allowing those promoting development initiatives to present them to a wider public and secure reactions informally

Parish Mapping

Arts-based way in which a community can explore and express what they value through the creation of maps made out of a wide variety of materials

Participatory (Urban or Rural) Appraisal (PRA and PUA)

Set of methods for gaining a rapid in-depth understanding of a community or certain aspects of it, based on the participation of that community and a range of visual techniques

- Semi-Structured Interviews
- Transects
- Mapping
- Time Charts
- Venn Diagrams
- Flow Diagrams

Planning Day

Day when people work intensively on developing urban design options for a site or neighborhood

Planning Weekend

Highly structured, intensive procedure in which professionals work with local people over a long weekend to produce proposals for action

Resource Centre

Place designed to provide community groups with the facilities they need to make the most of their energies and enthusiasm.

Roadshow

Series of linked public workshops exhibitions and forums to explore the potential for improving the natural and/or built environment

Round Table Workshop

Workshop process for engaging the main stakeholders in generating a vision and strategy for an area

Street Stall

Way of securing public comment on planning issues by setting up an interactive exhibition in a public street or square Can be a s simple as a table with drawings of proposals taped to it on which passers-by can comment or vote with sticky dots or post-it notes (used at the St. Elizabeth Expo (June 1997)

Task Force

Multidisciplinary team of students and professionals who produce in-depth proposals for a site or neighbourhood based on an intensive programme of site studies lectures, participatory exercises and studio work, normally lasting several weeks

Topic Workshop

Session at which a group, usually aided by a facilitator, explores problems, dreams and action needed in relation to a particular topic

Trail

Carefully planned walk through an area designed to help people understand the problems and opportunities

Urban Design Soapbox

Huge video screen linked to booths allowing people to broadcast their views on local planning issues

Web Site

The use of the Internet to provide discussion groups or interactive material This can be used on urban design projects

5-8 RESEARCH, MONITORING AND EVALUATION

5-8 1 Introduction

The guidelines for protected areas management stipulate that management must be based on the best available scientific information Only through research, monitoring and evaluation will it be possible to develop the necessary understanding of the many complex interrelationships among the ecosystems and human activities in the Black River area, most of which have never been studied Research is needed to develop baseline data

Monitoring and evaluation provide insight into long-term changes in the protected area While some of the environmental, social and economic changes are obvious, others are more subtle, and none is well documented or completely understood In the longer term, monitoring and evaluation will provide the insight into long-term changes in the Protected Area and an indication of the effectiveness of management However in the short term where a baseline is lacking or poorly developed monitoring will have to rely on tracking the implementation of the management programme and measurement against selected indicators

5-8 2 Purpose

Research and monitoring programmes will help the reserve managers to establish a baseline of information on interactions among resources ecosystems natural functions and human activities and thus to develop and test hypotheses about the ways in which they interact

5-8 3 Vision

A research and monitoring programme that is carefully designed to allow managers to

- evaluate the effectiveness of the protected area management programmes
- distinguish between the effects of natural variability and human activities,
- develop and test hypotheses about causal relationships
- select and evaluate management actions,
- share and disseminate information,
- meet the reporting and proposal requirements of funding organizations, and
- meet the needs of other stakeholders as rapidly as possible

5-8 4 Desired Outcomes

The short-term outcomes of the research and monitoring programme will include

- identification of priority subjects and areas for study, further study or intervention,
- design and assessment of an effective long-term monitoring programme
- establishment of strong links between the scientific community, resource management agencies and resource managers,
- initiation of a programme of research and monitoring that is relevant consistent with the goals of the protected area and not damaging to the resources

5-8 5 Research Strategy/Approach

5-8 5 1 Objectives

Objectives will include

- getting studies done at least cost (e g through collecting data using protected area staff, recruiting external organizations and volunteer groups, or commissioning research where necessary)
- incorporating a research component into each resource user projects (training beneficiaries to record and report specific data)
- setting priorities for relevant research, e g
  - rapid ecological assessments,
  - specific resource assessments, and
  - baseline and long-term monitoring programmes (specially related to water quality wildlife and restoration programmes),
- advertising priority research topics,
- establishing a permitting system for research with an associated fee schedule

Table 5-8 1 Stakeholders in Monitoring and Research	
Government Agencies NRCA - Coastal Zone NRCA - Watersheds NRCA - National Parks and Wildlife NRCA - Pollution Control NRCA - Public Education NRCA - Enforcement and Compliance NRCA - Technical Studies and GIS	 ECD NWC WRA JTB TPDCo Fisheries Division Forestry Department
Local residents Resource User Groups - especially those involved in resource use / improvement projects Sub-Area Councils Bird watchers The general public	NGOs and community-based organisations BREDS SEEPA
Private businesses and companies Appleton Alpart Hoteliers and villa owners Boat tour operators	Other organizations and institutions IUCN International Donors University of the West Indies The worldwide academic community

5-8 5 2 Priorities and Selection Criteria

Research is fundamental to the management of the reserve It is important that it should be directed toward priority issues Some of these have been identified in the draft EPF and in the draft subarea programmes and plans and are listed in Table 6-6-2 Others will emerge over time

Criteria will need to be developed to guide the identification of research priorities The following are suggested

- Is the research directed towards realizing the fundamental vision and outcomes of the BRMRPA (Chapter 4)?
- Does the research address practical needs of resource-dependent communities?
- Does it address now or never" opportunities (e g oral history among shrimp fishermen)?
- Will the research damage the resources of the BRMRPA?
- How much support effort is required of the LME, Sub-Area Council etc ?

Selection of research topics should also be carefully integrated with data developed during required monitoring activities

It will also be critical to remember that no matter how much research is done many questions will remain Therefore managers will often have to make interim decisions based on the information available rather than postponing important actions until data have been collected and analyzed

Table 5-8 2. Priority Research Topics in the proposed Black River Managed Resource Protected Area

Research Category	Research Topic	Priority Location / Sub-Area	Priority Level	Lay Participation
Species Assessments	Shrimp (7 species) biology ecology status management needs	Lower Morass	I	
	Black land crab biology ecology status management needs	BRLM Font Hill	II	
	Blue swimming crab biology ecology status management needs	BRLM	II	
	Crocodile status	Font Hill	I	✓
	West Indian Whistling Duck (WIWD) (ongoing)	Upper Morass entire area	I	✓
	Migratory birds	Entire area	III	✓
	Migratory shorebirds	Font Hill Parottee Great Pedro Pond	II	✓
	Bats	?		
	Finfish	Coastal waters and Black River system		
Ecosystem Assessments	Quick assessment of wetland conditions agricultural uses management needs and opportunities etc	Upper Morass entire area	I	
	Rapid Ecological Assessment	ditto	II	
	Coral reefs inventory of baseline conditions identification of spots for snorkeling and diving	Especially east of Black River estuary	II	
	Sea grass beds inventory of baseline conditions	ditto	II	
	Springs and freshwater ponds	Wallywash	I	
			I	
Water Quality Baseline	Offshore – build on SCSD and/or CWIP data	High levels of tourist use and pollution	I	
	Rivers – build on UWI / Appleton findings		I	
	Groundwater and wells	Select and develop baseline	I	

Research Category	Research Topic	Priority Location / Sub-Area	Priority Level	Lay Participation
Alien Species Control	Methods for eradication of Melaleuca	Middle Quarters	I	✓
	Methods for control/economic use of water hyacinth	Blockages	I	✓
	Methods of preventing new species introductions		II	
Ecosystem Restoration	Swamp forest replanting	Holland?	III	?
	Approaches to restocking/rebuilding depleted fish species	?	III	
	Development of artificial reefs	?	III	
Economic Species Management	Locations and methods of mariculture (especially casitas for lobster Irish moss culture)	Galleon etc	I	✓
Carrying Capacity	Refinement of the Black/Broad River Tourboat Capacity study	Black Broad Rivers	I	
	Rafting	MQ systemwide	I	
	Selected beaches	All category I		
Oral History	Traditional sustainable shrimp fishery	MQ/Frenchmans Is	I	✓
	Traditional medicinal uses of plants	?	II	✓
	Changes in vegetation former location of species resource use practices etc	Everywhere		✓
Tourism/Ecotourism	User Fees/contributions and share to LME			
	Market assessment of local demand for nature and community tourism			
	Special attraction feasibility studies			
	Identification of additional activities			

5-8 5 3 Research Action Plan

Initial actions will include establishing a BRMRPA scientific advisory committee The committee will help the protected area staff to identify research priorities Another immediate action will be to seek funding or support for rapid ecological assessments, carrying capacity studies and selected surveys (e g status surveys of crocodiles, WIWD and bats) The LME could advertise priority topics on its web-site The LME should also set up a permitting system and a fee schedule under which it would make arrangements with academic institutions and others to undertake research projects that meet the criteria

Table 5-8.3. Action Plan for Research by Priority

	Priority	Respy	Phase
1 Establish scientific advisory committee	High	LME	I
- develop a preliminary list of members	High	NRCA	I
- set terms of reference	High	Cttee	I
- refine criteria for setting research priorities	High	Cttee	I
- identify research priorities	High	Cttee	I
2 Develop permitting system - establish a legal framework set fee schedule design forms and procedure	High	NRCA /LME	I
3 Advertise research priorities on the World-wide Web	Med	LME	2
4 Review external research requests/proposals	Med	NRCA /LME	2
5 Seek funding and support for selected locally-sponsored projects	High	LME	1
6 Coordinate research	High	LME	1
7 Disseminate results of research	Med	NRCA /LME	2

5-8 6 Monitoring Strategy/Approach

5-8 6 1 Objectives

Objectives will include

- an assessment of the performance of the Management Plan and Sub-programmes in relation to the expected performance
- determination of where performance has fallen short of or exceeded expectations with a determination of their causes and
- recommendations for addressing continuing recurring and new problems

In order for these objectives to be achieved it is important that they be set as quantitatively as possible

5-8 6 2 Monitoring Indicators

Although this is a very important element in the programme, problems can arise in its implementation Such problems may include

- overlooking evaluation because other tasks seem more urgent
- collecting available data rather than essential data,
- spending too much time, effort or money collecting nonessential data,
- failing to store analyze and interpret data
- analyzing data at an inappropriate scale or in an inappropriate format and
- failing to ensure that important reports are circulated to appropriate readers

Thus the planning of the monitoring process and establishment of a monitoring programme that focuses on the most important indicators is very important at the outset of the project

Types of indicators Funding for this aspect of the programme is liable to be limited so it will be important to

- select indicators carefully,
- use external sources of information where possible (e g tourist statistics from JTB fisheries statistics from Fisheries Officers at fishing beaches),
- enlist voluntary help where possible (e g bird counts, turtle and

coral cover reports from dive operators incident reports)
- participate in national or international programmes (e g CARICOMP) where appropriate

CARICOMP is a Caribbean-wide monitoring programme for coastal productivity

Development of a detailed set of indicators is beyond the scope of this document two approaches should be examined during this effort

First is a Monitoring and Evaluation "Scorecard developed by PROARCA/Costas (Draft 10 21 97) This document is designed to measure protected area management effectiveness on a regional basis The NRCA s PAMB proposes to use it as a tool in tracking the effectiveness of Jamaica s protected area management Indices include Site Management Local participatory decision-making Capacity-building Local National and Regional Policy and Institutional Strengthening (The entire document can be found in Annex D)

Secondly some possible subject areas where quantitative indicators could be developed and monitored are listed in Table 5-8 4 Some combination of the two approaches that is tailored to the specific priority objectives of the BRMRPA will need to be developed by the LME with the assistance of the NRCA

An indicator may be any measurement of environmental conditions or trends It may be a direct or indirect measure, or a subjective judgement

5-8 6 3 Suggestions for Monitoring Programme Design

1 Design monitoring programme The programme should be designed in three phases to cover start up intermediate and long-term phases Questions to be addressed include

- What types of information are necessary to measure progress towards the desired outcomes?
- What types of information are available from other sources?
- What types of information will need to be collected?
- Are special plans needed to collect data from special events (e g hurricanes earthquakes fires, floods)?

2 Collect and evaluate information
- Who will collect it? Possibilities include enforcement officers, NRCA staff other government agencies volunteers students, etc
- What equipment and data forms are needed?
- What training will be needed to carry out data collection?
- Who coordinates data collection and storage?
- What is the best format for data storage to facilitate sharing of data?

3 Use information
- Who receives and stores data?
- Who interprets data and circulates reports?
- What is the reporting period?
- How are reports used to change programmes and priorities?
- How should monitoring programmes be modified in short and long terms?

5-8 6 4 Monitoring Action Plan

See Table 5-8 5

Table 5-8.4: Some Suggested Categories and Types of Indicators	
Environmental Indicators	
Protection and conservation	Index of selected species (e g West Indian Whistling Duck) Numbers of birds on selected ponds by species Area of reed beds planted Area of melaleuca removed Area of swamp forest mangroves restored Frequency of fires Baseline studies of selected core areas % coral cover on selected reefs Algal growth in selected areas
Water resources and quality	Stream flows at selected points Selected easily measured parameters e g nutrient loads silt colour odour algal or plant growth
Harvestable resources	Catches of fish and shrimp Number of fishermen (by method and beach and fishing ground) Data on fish kills
Visual quality	Number and size of illegal dumps Number of pieces of rubbish on selected stretches of roads Number of badly-placed and illegal signs and structures
Social and Economic Indicators	
Interpretation and public education	Number of school visits Number of media articles *Number of outreach visits* Awareness survey results
Cultural resources	Number of historical structures identified repaired or designated
Tourism and recreation	Number of sport fishing permits Number of new tourist rooms constructed Percentage occupancy Number of tours
Law enforcement	Number of enforcement visits Number of incident reports Number of investigations Number of prosecutions
Economic indicators	*Number of tourist visits*

Community participation	Number of active councils Number of council meetings Number of people attending meetings Number of volunteer-hours contributed
Administration	
Administration efficiency	Proportion of budget spent on administration vs project activities Number of staff receiving training (or courses and workshops attended)

Table 5-8.5: Draft Monitoring and Evaluation Programme Action Plan

1 Design monitoring programme	SHORT	MEDIUM	LONG
Set objectives	X		
Identify priority objectives	X		
Establish base line conditions	X	X	X
Identify means of measurement recording	X		
Zone natural areas for comparison	X		
Estimate cost secure funds	X	X	X
2 Collect and evaluate information			
Train data collectors in techniques	X	X	X
Train staff in evaluation methodology	X	X	X
3 Use information			
Annual State of the Protected Area Report	X	X	X
Newsletter stakeholder updates etc	X	X	X
Review and change management approach	X	X	X
Update management plans	X	X	X
Review and update monitoring programme (every five years)	X	X	X

4 Form monitoring partnerships E g with			
Fisheries Division	X		
UWI			
NWC	X		
EC/MOH			
WRA	X		
South Coast Resort Board			
JTB/TPDCo	X		
SEEPA			
5 Expand informal monitoring capacity			
Citizens			
Game wardens Fisheries Inspectors			
Schools programmes			

5-9 ZONING

5-9 1 Introduction

Zoning is fundamental to management of natural resources and their users in protected areas It is a management tool that has been used in protected areas around the world to protect natural resources from over use and to separate conflicting uses while facilitating sustainable use The aim of zoning is to enable the protected area managers to focus management efforts on selected areas, while addressing broader issues throughout the whole area

5-9 2 Vision

A protected area whose wide variety of sensitive ecosystems are protected and conserved by regulation of selected activities within zoned areas and by encouraging activities that are compatible with protection of resources and natural ecological functions

5-9 3 Desired Outcomes

To achieve the above aim the following objectives must be accomplished

- Reduction of stresses from human activities on areas of importance for sensitive wildlife and habitat by restricting access to selected areas,
- Protection of biological diversity in large areas of contiguous habitats that support important spawning breeding nursery feeding and loafing habitats,
- Minimization of conflicting uses and damage to important habitats
- Prevention of heavy concentrations of uses that could degrade resources
- Provision of undisturbed monitoring sites for research and comparison with more heavily used sites over the long term

5-9 4 Proposed conservation zones

The proposed zoning system includes several new categories developed specifically for the Black River Managed Resource Protected Area (Table 5-9 1) Most of these categories apply equally to terrestrial marine and wetland areas Existing categories under various acts will also be used (Table 5-9 2) Some areas may be included in several zones

Conservation Areas The category of Conservation Area is the most general and extensive proposed type of zone Its main objective is to ensure integrated management and law enforcement in a complete range of contiguous ecosystems in the Black River area from the Upper Morass to the edge of the island shelf This will provide broad protection for many species and functions It will also afford visitors the opportunity to see a cross section of ecosystems in their natural or nearly natural state

Wildlife Protection Areas These areas are of importance to wildlife and natural ecosystems The primary purpose is to provide effective protection for areas in which natural regeneration is expected to result in replenishment of stocks, and intervention is likely to be minimal Special categories may be developed within this category such as sea turtle reserve (managed on a seasonal basis to protect nesting sea turtles waterfowl reserve West Indian Whistling Duck reserve Special sets of conditions may eventually be developed for them as necessary

Restoration Areas These areas include threatened or economically-important ecosystems or habitats for threatened or economically important species that have been affected by human activities and need human intervention to restore their natural species composition and functions They include all remnants of swamp forest selected areas of mangroves lagoons, herbaceous wetlands coral reefs and sea grass beds

Private Conservation Reserve Many important areas for wildlife are on private lands This purpose of this proposed category is to develop protocols to bring private land into the protected area system through development of partnerships and provision of incentives

Scenic Route These roads trails water courses or coastal water routes are of outstanding scenic value The purpose of this category is to provide such routes with special recognition and to develop ways to conserve and enhance their scenic qualities through planning controls garbage collection and public education

High Intensity Recreation Area These areas are managed primarily for recreation although this must still be consistent with conservation objectives for the area Resource users will be subject to licences which will stipulate that a portion of revenue (either as a licence fee or as a cess) is paid to a central fund for conservation of the area Carrying capacity studies will be required and strict rules about appropriate enterprises will be introduced (e g for boat tours factors such as type and design of boats speed limits boat handling techniques and numbers and timing of boat trips will be controlled)

Low Intensity Recreation Area Low intensity recreation areas are managed for nature tourism rather than mass tourism They include areas zoned for boat trips in small canoes or kayaks sites visited by special interest tours (e g for bird watching) bird watching hides and nature trails and interpretive centres in wildlife protection areas and restoration areas beaches designated for low intensity use coral reefs zoned for diving

Each area will have its own management problems and needs and thus its own plan There will normally be some basic infrastructure to support the tourist activities e g a pier an information centre and story board signs a hide for bird watching a boardwalk a marked trail etc Structures will have minimal impact on the environment and will take conservation into account into their design and operation (e g use of composting toilets in remote areas)

Table 5-9 1. Proposed Zoning System - Objectives and Strategies

CATEGORY	OBJECTIVES	STRATEGIES
Conservation Area	- To ensure integrated conservation of natural resources through overall low-level protection for entire area	**Regulations** regulates development (sewage disposal height density EIAs) provides incentives guidelines for developers **Management activities** develop guidelines for specified activities e g tourism settlements and housing agriculture **Plans** Not area specific but cover whole protected area e g for water resources wildlife **Special projects** Promote sustainable use of resources
Wildlife Protection Area	To conserve threatened ecosystems and species by protection of important habitats (e g sea turtle nesting beaches West Indian Whistling Duck breeding areas)	**Regulations** Controls access use and seasons **Plans** Will be area specific and will follow management plans as necessary **Special projects** Research habitat needs as necessary
Restoration Areas	- To restore degraded habitats or depleted populations and thus conserve threatened or economically important species or ecosystems	**Regulations** Controls access use **Management plans** required for each unit **Special projects** Experimental restoration in selected areas
High intensity recreation area	- To focus high intensity recreational activities in specially managed areas To ensure that recreational activities do not exceed the carrying capacity of the area	**Regulations** control types of activities levels of use in specified places **Management plans** required for each area **Special management actions** Provision of facilities as necessary **Research and monitoring** Research into carrying capacities

Low intensity recreation area	- To facilitate recreational use in combination with conservation	**Regulations** controls types of activities levels of use in specified places
Private conservation reserve	- To encourage private land owners to promote conservation	**Regulations** Incentives (e g tax breaks) **Management plans** required for each area (prepared by owner with assistance from LME) **Partnerships** with each owner **Special projects** To be developed with land owners
Scenic route	- To conserve visual and environmental quality along selected routes	**Regulations** Special management actions Research and monitoring
Special planning area	- To ensure developments in sensitive areas do not degrade the environment	

Table 5-9.2: Existing Categories Protected Areas of Relevance to Black River

CATEGORY	LAW	AGENCY
Fish Sanctuary	Fishing Industry Act	Fisheries Division
Forest Reserve	Forestry Act	Forest Department
Game Sanctuary	Wild Life Protection Act	NRCA
Protected National Heritage	National Heritage Trust Act	JNHT
Protected National Monument	National Heritage Trust Act	JNHT
Tree Preservation Order	Town and Country Planning Act	TCPA

Table 5-7.3 Proposed Zones and Compatible and Incompatible Activities

CATEGORY	COMPATIBLE ACTIVITIES	INCOMPATIBLE ACTIVITIES	SUGGESTED AREAS
CONSERVATION AREA	All human activities subject to existing laws plus specially developed guidelines (e g for housing settlements and commerce vending industry agriculture roads mining and tourism) All developments will require approval Mitigation measures or habitat replacement may be required	No specific activities will be prohibited but all activities must be ecologically sustainable and consistent with conservation objectives (E g no hotels and villas taller than the tallest tree on the property)	Whole managed resource protected area
WILDLIFE PROTECTION AREA	Human activities will be restricted to monitoring law enforcement research and supervised wildlife watching Restrictions may be seasonal	Resource harvest (e g fishing except with hand lines logging charcoal burning) Selected activities will be prohibited either seasonally or all year round	Font Hill Wildlife Reserve
RESTORATION AREA	Wildlife watching research and monitoring habitat management subject to management plan (e g replanting control of water levels control of invasive species provision of nest boxes changes in water courses and channels Subject to licence wildlife tours low intensity tourism artisanal or sport fishing plantations of indigenous resources e g thatch measures to enhance natural populations of shrimp	High intensity tourism Extractive activities (e g mining logging) Agriculture	Lower Morass Broad River and area to south Middle Quarters River All swamp forests All riverine forests Parottee Pond Wallywash Pond Other ponds (to be specified) Upper Morass Around pumping station (other areas to be determined) Treasure Beach Great Pedro Pond
HIGH INTENSITY RECREATION AREA	Tourism including tours in large boats and buses (subject to licence) Public bathing beaches and attractions managed to accommodate large numbers of people associated car parks picnic areas shops stalls cafes and restaurants interpretive centres in specified areas only	Unlicenced activities Heavy industry Ports Waste disposal Food processing	Black River town Black River to Broad Water and thence to Salt Spring Selected bathing beaches Lovers Leap (view point)

LOW INTENSITY RECREATION AREA	Nature tourism interpretation and basic services Artisanal fishing Use of bicycles canoes and kayaks Hiking Camping in approved camp sites Picnicking	High intensity tourism Vending except in designated areas Marinas Extractive activities Use of ORVs or motorcycles on trails Water sports	All rivers except as specified above Selected bathing beaches Lovers' Leap (trails to sea) Pedro Bluff
SCENIC ROUTES	Any human activity so long as it is (or can be made to be) visually in harmony with the landscape	Unsightly developments E g High rise buildings Structures and signs that block vistas Unscreened garbage dumps Garages that park cars on streets Razor wire fences Quarries on exposed hillsides Shacks	Most main roads around the morass Waterways Coastal routes from Alligator Pond to Scotts Cove

Table 5-9.4 Suggested Action Plan for Zoning

ACTION	SHORT	MEDIUM	LONG
1 Development of local legal framework for zoning including - seeking legal advice about how zoning requirements fit with existing regulatory framework and what additional regulations are necessary - new regulations for private conservation areas including incentives as necessary - requirements for licences for specified activities (including list of activities charges conditions)			
2 Development of management guidelines for specified activities in Conservation Areas			
3 Development of management plans for specific areas and resources(see natural resources)			

6-1 FONT HILL AND ENVIRONS SUB-AREA PLAN

6-1 1 Introduction

This subarea includes the coast to the west of Black River from Chocolata Bay to Scotts Cove It includes government-owned and private lands at Crawford Malcolm Bay and Luana/Font Hill The outstanding value of the wetlands of the Font Hill property has long been recognized and this has led to many proposals and plans for protection (see the EPF) Its ecology is closely linked with that of the Black River Lower Morass Both are rich in wildlife, and many species moves freely between the two in response to water levels and availability of food and other resources potentially carry pollutants from Black River along the coast The current proposal recognizes the strong ecological links between this area and the Black River Lower Morass and proposes that the management of the two areas should similarly be linked

6-1 2 Desired Outcomes

The main objective for the Font Hill and environs subarea is integration of conservation on public and private land to ensure the long-term survival of nationally important populations of threatened species specially crocodiles, sea turtles and West Indian Whistling Ducks Interpretation and recreation will be incorporated as far as is consistent with the main objective

6-1 3 Present Conditions

6-1 3 1 Natural Resources

Terrestrial, Freshwater and Brackish Ecosystems The land is gently sloping and is mostly 3-4 m above M S L Along the coast there are several white sand beaches and a complex of mangroves, fresh, saline and brackish ponds herbaceous wetlands coastal woodlands and savanna

Marine Ecosystems The benthic habitats suggest considerable marine productivity There are extensive sea grass beds and coral reefs There are shallow sea grass beds which *act as fish nurseries* and were once favoured by manatee Other *special features include the emerged fossil reef and an unusual polychaete 'reef" that requires special conservation measures* The sea bed slopes gently to the reef crest, but then shelves steeply to the drop off (which is particularly close to shore at Scotts Cove)

Animals The beaches at Luana Point and Malcolm Bay are *of national importance for nesting sea turtles and crocodiles* Recent surveys have confirmed continued high levels of sea turtle nesting but there are no recent data for crocodiles West Indian Whistling Ducks and Masked Ducks feed and breed in the ponds of Font Hill and Hodges *Surveys of these species are also needed* Many species of migrant shorebirds depend on the mud flats and shallow mangrove pools while game birds including White crowned Pigeons, breed in the mangroves and coastal woodlands which also support interesting fauna including migrant songbirds Other important species include manatees and pond turtles

Plants The coastal woodlands include the typical coastal species of small trees and shrubs (such as sea grape, thatch palms, and burnwood The once dense growth of a rare endemic hybrid orchid (*Broughtonia sanguinea x negrilensis*) has been almost completely lost Inland the woodlands were cleared and put into pasture which has been over grown with logwood

Linkages It is probably not coincidental that the mangroves of the shoreline correspond with extensive coral reefs and sea grass beds in the marine environment Together these ecosystems undoubtedly contribute to marine productivity and fisheries There are strong ecological links with the Lower Morass (see above)

Sites of Special Importance Beaches (specially Luana Point and Malcolm Bay) berms mangrove ponds freshwater ponds and lagoons are of great importance for wildlife The mangroves behind Malcolm Bay appear specially well preserved

Mineral Resources The sand dunes of Hodges property form the most important national reserve of silica sand and are being mined by West Indies Glass but this company is scaling down its operations because of reduced demand as plastic bottles replace glass ones *Mined out sites are not being rehabilitated The flora of the sand dunes has not been assessed*

Illegal mining of beach sand on Galleon Beach has contributed to coastal erosion *The control of illegal sand mining is an important, but politically difficult, issue*

6-1 3 2 Water Resources

The availability of water is a limiting factor to development in this area The groundwater near to the coast was not contaminated by saline intrusion in 1994 However nitrate and total and faecal coliform levels were elevated

6-1 3 3 Cultural and Economic Resources

There are fishing beaches at Scotts Cove Galleon Beach/Crawford and Hodges About 300 fishermen operate from Scotts Cove There is an active fishing coop in Crawford

There are several historic buildings including Font Hill Great House and Hodges Great House and a wreck off Galleon Beach

Table 6-1 1 Stakeholders in Font Hill and Environs

Local Residents

Bird watchers
Business people (shop owners restauranteurs)
Householders
Hunters
Property owners and managers
Small farmers
Sport fishermen
Subsistence fishermen
Wage earners
Unemployed people
Villa owners (Seaside Park)

NGOs and Community-based Organizations

Sea
Crawford Fishing Cooperative

Private Businesses and Companies

West Indies Glass

Government Agencies

Resource Use - specific
JTB
NRCA (Game Sanctuary)
TPDCo
PCJ

Resource Use - general
RADA
Fisheries Division
Division of Mines and Quarries
Pesticides Control Authority
ODP

Development Planning
Commissioner of Lands
NRCA
PWD
St Elizabeth Parish Council
TCPA

Water Supply and Pollution Control
ECD
Ministries of Water
N C
National Irrigation Commission
Southern Parks and Markets
WRA

6-1 3 4 Recreation and Tourism

Scotts Cove This is a traditional location for roadside fish vendors It is a potential beauty spot and focus for tourism, including diving but is marred by unsightly stalls rubbish, a water tank and an unrestored quarry site Its future is threatened by port development *This site has great potential and needs upgrading* in a way that will not exclude the fish vendors Because of the proximity of deep water it has been proposed as a potential location for a deep water pier (e g for shipping limestone or for cruise ships)

Font Hill Beach Because of the shortage of bathing beaches in the area this beach was being used by the public To control the ecological damage, it was recently upgraded by PCJ and leased to a private contractor to operate as a public bathing beach A study carried out in the 1980s (Hendry 1988) showed that this beach has a maximum carrying capacity of 100 persons The current lease does not include any cess to help subsidize conservation of the adjacent wildlife reserve

Galleon Beach The Crawford end of Galleon Beach is a fishing beach Members of the public use the central part of Galleon Beach for bathing, but there are no facilities there The beach is eroded and polluted

Chocolatta Bay This is a fishing beach The NRCA described it as a public beach in its 1995 coastal reconnaissance

Resort Development There is no development at present but recurrent interest has been shown in the area's possibilities PCJ has zoned part of Font Hill for low-density resort development The owners of Longacre have also expressed interest in hotel or theme park development

6-1 3 5 Other Human Activities

Agriculture There is some cattle pasture and other land suitable for livestock tree crops forestry apiaries and ground crops such as pumpkin PCJ has successfully established a trial fuelwood plantation Leadwood has been especially successful

Human Settlements and Infrastructure As the town of Black River grows there is pressure to expand the town into the attractive green field sites around it and ribbon development is spreading along the roads There is an approved subdivision at Chocolata Bay and two Operation Pride sites on the Font Hill property *Settlements with no infrastructure or sources of employment nearby are likely to put pressure on natural areas As far as possible the tendency for Black River to sprawl into surrounding areas should be contained* The older settlements are in Crawford and Galleon Beach The unplanned settlement at Crawford is growing

The main coast road runs through the area *This has been proposed as a scenic road* but plans for port development include realignment to the north to allow for construction behind Scotts Cove Part of the property has been identified as a potential site for a municipal airfield or even a regional airport to serve southern St Elizabeth and Westmoreland *This possible project should be preceded not only by an examination of the environmental impacts on the immediate are but on the growth-inducing impacts in the area and throughout the MRPA and its compatibility with principles of sustainable development*

Large quantities of rubbish are dumped illegally along the main road also by Galleon Beach and on Font Hill property Cattle and donkeys left to graze on verges frequently cause accidents on a highway

Commercial Activities Mining (see above) At Scotts Cove the 200 m benthic contour comes closer to the shore than at any other site between Kingston and Savanna la Mar Inevitably there is great interest in developing port facilities to take advantage of this Piers for cruise shipping and limestone export have been proposed *There should be careful consideration of the compatibility of any type of port construction with tourism and conservation and housing projects in the vicinity before any decisions are taken*

Research and Education Font Hill has been one of the locations of a long term survey of winter migrant birds

Traditional Uses No data

Main Threats and Incompatible Uses
1 Beach sand mining and turtle nesting
2 Uncontrolled harvest of mangroves and conservation
3 Increasing human settlements and wildlife conservation

Potential Incompatible Uses
1 High density tourism and wildlife conservation

Vulnerability to Disasters and Disaster Preparedness Storm surge and flooding are potential problems which should be taken into account in zoning and design of coastal structures

Past and Present Conservation Attempts The Font Hill property has repeatedly been identified as a priority area for protection e g in the UDC s South-West Coast Development Plan and the Protected Areas Systems Plan (JCDT) and proposed as a Font Hill Wildlife Sanctuary (PCJ) and a Crocodile Reserve (C Swaby) It was declared a Wild Life Reserve in 1990 The property is owned by PCJ, which has identified 249 ha for conservation This area has been fenced and access is strictly controlled by two wardens Illegal sand-mining has been eliminated most grazing animals have been removed and squatters relocated Fishing with nets in the ponds has reportedly been eliminated and with it the illegal slaughter of crocodiles

A consultant is currently drafting a management plan for PCJ who intend to manage it directly The plan is expected to focus on wildlife conservation and non-conflicting recreational and educational activities Unfortunately the PCJ property boundary bisects the wetland and some important areas are in the adjacent property to the east which is privately owned *If possible the whole area should be managed in an integrated fashion with management plans for adjacent properties sharing common goals and strategies*

Existing Legal and Management Framework Font Hill has been gazetted as a Wildlife Sanctuary under the Wildlife Protection Act Two wardens are employed by PCJ to protect it It has also been completely fenced

6-1 4 Management Strategies for Immediate Implementation

6-1 4 1 Natural Resources

Ecosystems
- Carry out a REA of the Sub-area to determine current status of important ecosystems specially mangroves ponds beaches reefs and sea grass beds and identify the nature and scale of threats to them including determining to what extent important ecosystems are included in existing protected areas
- All remaining wetlands should be effectively protected
- Encourage property owners to develop management plans for their properties which are consistent with the overall strategies for the area

Animals
- Carry out a crocodile survey The survey should provide an estimate of the number of crocodiles present and the carrying capacity of the reserve It should also identify critical habitats (specially nesting habitats) and any other important management needs
- Monitor sea turtle nests annually
- Carry out a survey of West Indian Whistling Ducks (this should be part of a survey for the whole MRPA)

Plants
- Carry out a survey of West Indian Whistling Ducks (this should be part of a survey for the whole MRPA)
- If possible find and manage any remnant orchid populations

Renewable Resources
- Work with land owners to limit theft of charcoal and timber
- Assess potential for sustainable use of wetland and fish resources including options for alternatives (see relevant sub-programmes)
- The use of agrochemicals in any agricultural development north of the wildlife reserve would have to be considered carefully to ensure minimum damage to coastal ecosystems by runoff

Mineral Resources
- Work with West Indies Glass and Mines and to develop guidelines for sand mining
- Work with Parish Council and PWD to control illegal sand mining

6-1 4 2 Cultural Resources

PCJ would like Font Hill Great House to form the nucleus of a small hotel, related to farming and horseback riding with a density of 5 rooms per ha

6-1 4 3 Human Settlements and Infrastructure

- No further expansion of settlements should be allowed
- An impact assessment must be required before any development of air facilities is permitted at Font Hill
- Clean up garbage along roads and beaches
- Place stumps along roadside to restrict truck access
- Identify cause of roadside dumping and address it
- Examine infrastructure and job creation for Operation Pride sites
- Ensure orderly planned growth of Crawford, with adequate infrastructure

6-1 4 4 Tourism and Recreation

Beaches Require assessment of importance for wild life and suitability for tourism The beach to the east of Luana Point and part of Malcolm Bay should be zoned for wildlife protection

Resort Development If resort development is contemplated it must be carefully zoned to minimise damage to wildlife It should be low density and tertiary sewage treatment should be considered

Interpretation Both Font Hill and Longacre have potential for limited tourism with a strong emphasis on interpretation (see below)

6-1 4 5 Public Education, Public Relations and Interpretation

Plans have been developed for interpretative trails and the possibility of canoeing on the pond system has been identified An interpretive centre should form the nucleus of such plans There are also possibilities for interpretation at Galleon Beach and Malcolm Bay Sea turtle nest watches are another possibility A small pond, to the north of the road in part of the agricultural area, is scenic, and important for ducks The possibility of including an interpretive site should be considered although access routes would have to be carefully designed because it is on a dangerous corner Bay These suggestions need to be reviewed in the context of species management objectives These suggestions need to be reviewed in the context of species management objectives

6-1 4 6 Legislation and Enforcement

Enforcement Better enforcement of the law on sand mining and on protection of turtles are the most urgent needs

Monitoring Factors that require monitoring include sea turtle nesting (approximately 14 mornings p a), beach water quality, number of visitors to beaches and other facilities water levels in ponds and incident reports

Boundaries and Zoning It is impossible to determine the exact boundaries and zoning on the basis of the current incomplete ecological information

Table 6-1.2 Major Zones Proposed for the Font Hill Sub-area		
CATEGORIES	SUGGESTED AREAS	NOTES
Conservation Area	Whole MRPA	Special attention to be paid to development control and law enforcement
Wildlife Protection Area	Selected mangroves and beaches probably including bay east of Luana Point and part of Malcolm and Galleon Beaches Other areas to be determined	Data on habitat use by threatened species is too incomplete to develop a complete list for this category It should include any critical habitats for threatened species (specially West Indian Whistling Ducks crocodiles and turtles) that are not covered under the following category It may be necessary to extend the protected area to include ponds north of the road if they prove to be of importance to wildlife
Restoration Area	Selected areas of herbaceous wetland Mangroves	The need to use this category in this sub-area will be determined following the ecological assessment
High density recreation area	It may be necessary to extend the protected area to include ponds north of the road if they prove to be of importance to wildlife	This category will help to reduce conflict among boat tours conservation and artisanal fishers and between bathing and wildlife conservation
Low density recreation area	Trail routes interpretive areas selected beaches (to be determined)	
Scenic routes	Main road from Black River to Scotts Cove	Maintenance and improvement of visual quality will require public education and vigilance
Private Conservation Areas	Longacre and Malcolm Bay	These areas are of great ecological importance and are threatened

Table 6-1 3 Areas Already Protected or to Be Declared under Existing Laws			
CATEGORY	EXISTING AREAS	PROPOSED AREAS	NOTES
Fish Sanctuary	None	To be determined	The need for fish sanctuaries in this sub area cannot be assessed on present data
Game Sanctuaries	Font Hill	None at present	
Tree Preservation Orders	None	To be determined	
Protected National Heritage and Monument	None	To be determined	

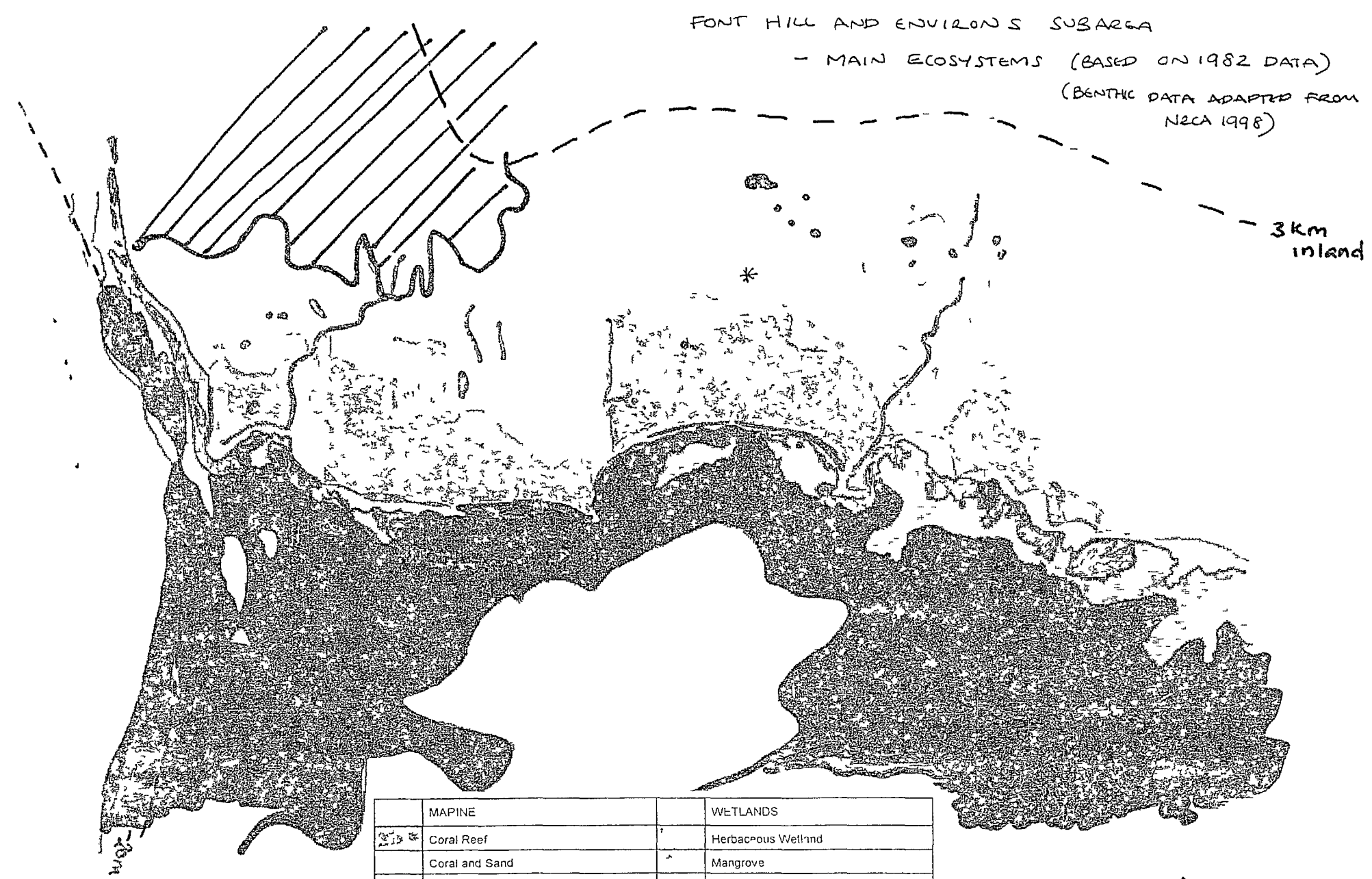
Table 6-1.4. Major Issues and Some Proposed Actions (Priority actions are shown in **bold**)

ISSUES	ACTIONS	SUGGESTED AGENCY
ECOSYSTEM AND SPECIES CONSERVATION AND RENEWABLE RESOURCES		
Lack of ecological data and current maps	- **Seek funding for REA** - **Seek funding to continue West Indian Whistling Duck surveys**	NRCA NPPA/LME West Indian Whistling Duck Working Group of Society for Caribbean Ornithology (Ann Sutton)
Some ecosystems require restoration	- Provide interim protection - Develop restoration techniques	NRCA NPPA / LME / TCPA TPD
Some plants may need propagation	- **Monitor rare plants** and collect for propagation if necessary	NRCA NPPA/National Arboretum Foundation
WATER RESOURCES		
Irrigation	Participate in **discussions of proposed irrigation schemes** as necessary	NRCA
Water pollution	**Monitor pollution incidents and beach water quality**	NRCA - Warden
LEGISLATION REGULATIONS AND ENFORCEMENT		
Destruction of resources	**Improve monitoring and enforcement of existing laws**	NRCA/ Parish Council
HUMAN SETTLEMENTS		
Solid wastes disposal in mangroves beaches roadsides	Seek root causes Improve public education Publicise alternatives **Clean up campaigns**	NRCA/SEEA/South Coast Resort Board/others?
Building in swamps and on beaches	**Moratorium on building in Galleon Beach**	
Divestment of agricultural lands for Operation Pride	**Request Lands Department not to divest any more land in the area** Monitor land use	NRCA NPWA NRCA - Warden

TOURISM AND RECREATION		
Carrying capacities of river beaches reefs other resources not known	Commission studies as necessary	NRCA / TPDCo / LME / South Coast Resort Board/ Developers
Proposed resort development	**Ensure public discussion of options and EIA**	NRCA /LME / South Coast Resort Board
Scenic routes marred by rubbish signs and unimaginative development	Enforce laws re roadside signs Educate public about visual pollution	Parish Council NRCA
PUBLIC EDUCATION AWARENESS AND INTERPRETATION		
Lack of awareness and public support	**Public consultations re EPF and draft Management Plan** Begin development of interpretive centre and trails (subject to ecological suitability)	NRCA/South Coast Resort Board West Indian Whistling Duck Working Group of Society for Caribbean Ornithology (Ann Sutton)

FONT HILL AND ENVIRONS SUBAREA
- MAIN ECOSYSTEMS (BASED ON 1982 DATA)

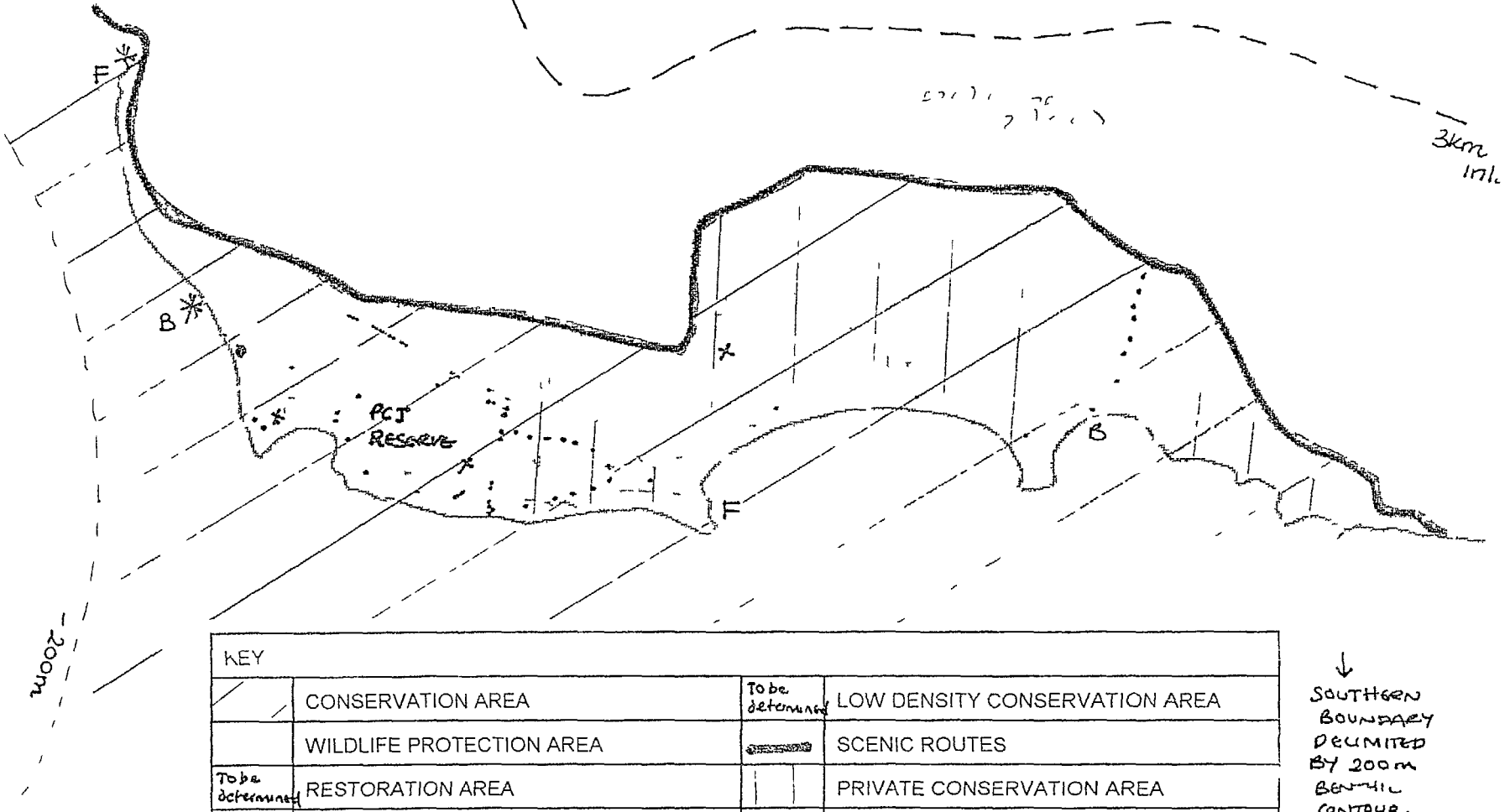
(BENTHIC DATA ADAPTED FROM NRCA 1998)



	MAPINE		WETLANDS
	Coral Reef		Herbaceous Wetland
	Coral and Sand		Mangrove
	Sand		Swamp Forest
	Sea Grasses (A D SCR D(ER)		Rivers pond and lagoons
	TERRESTRIAL		
	Agriculture		
	Coastal Woodlands		
	Dry Limestone Forests and Limestone Islands		
	Riverine Forests		
	SAND DUNES		

FONT HILL AND ENVIRONS SUB AREA
- DRAFT BOUNDARIES AND ZONING

↑N 1 50 1,000



KEY			
	CONSERVATION AREA	To be determined	LOW DENSITY CONSERVATION AREA
	WILDLIFE PROTECTION AREA		SCENIC ROUTES
To be determined	RESTORATION AREA		PRIVATE CONSERVATION AREA
*	HIGH DENSITY RECREATION AREA	F	FISHING BEACH
⊙ X	NATURE TRAILS (ROUTES TO BE DETERMINED) INTERPRETATION CENTRES, HIDES	B	PUBLIC BATHING BEACH

↓ SOUTHERN BOUNDARY DELIMITED BY 200m BENTHIC CONTOUR

6-2 BLACK RIVER LOWER MORASS SUB-AREA PLAN

6-2 1 Introduction

The Black River Lower Morass is the central unit of the planned MRPA It includes the entire Lower Morass with Parottee and Wallywash Ponds to the east Contiguous subareas include Bamboo Avenue-Lacovia to the north, Black River town to the west and Treasure Beach to the east

Since the 1960s this area has been repeatedly proposed for protection most recently in the EPF (see Chapters 2-6) This present draft management plan arose from the EPF and is intended to be presented to the public and discussed with it

6-2 2 Vision

The development of a managed resource protected area in Black River will give the community NGOs government agencies and businesses the opportunity to participate in a demonstration project for the sustainable development process

6-2 3 Desired Outcomes

Biodiversity Ecosystems plant and animal resources should be managed to ensure their long-term survival or threatened ecosystems and species facilitating use wherever it is feasible without detriment to the ecosystems or species
Water Resources The use of water resources should be coordinated to ensure sustainable management of water resources in the Lower Morass, with the objective of meeting community water needs without detriment to natural processes
Mineral Resources Mineral resources should be used as long as their use does not conflict with conservation objectives
Cultural Resources Conservation and interpretation of cultural resources should be integrated into the overall plan
Resource Harvest Use of feasible and harvestable resources should be maximized within the carrying capacity of the area
Tourism and Recreation Tourism will be a very important driving force for conservation and economic development but conservation of natural resources must take precedence over tourism

6-2 4 Existing Conditions

6-2 4 1 Natural Resources

Terrestrial, Freshwater and Brackish Ecosystems (see EPF Chapter 3) Most of the lower morass is dominated by herbaceous wetland, a mixture of grasses, sedges, lilies and similar plants It may appear uniform but the fauna and flora are diverse and there are at least four major zones with nine types of habitats (EPF Table 12), most of which are *rare elsewhere in Jamaica*, each with its distinctive plant and animal life Parts of the wetland are dissected by rivers streams, channels and canals There are also many ponds, which are *of special importance to many species*

Along the southern fringe of the swamp and beside the Black and Broad Rivers there are Red Black and White Mangroves Along the coast mangroves (mostly Black and Buttonwood) alternate with patches of coastal woodland *Both are threatened by coastal development* Small remnant patches of swamp forest with characteristic Royal Palms and big-leaved Anchovy Pears survive in small patches along the margins and in the centre of the swamp This type of forest is similar to that found in the Amazon and is *one of the rarest ecosystems in Jamaica*

Other rare ecosystems include the riverine forests near Lacovia where large guango trees overhang the river, several types of herbaceous wetland the riparian swale with many rare plants around the Styx River, and the limestone islands of Slipe and Cataboo which are highly disturbed but still retain some hardwoods and patches of Bull Thatch All the forest ecosystems are *being degraded by illegal harvesting of lumber (and agriculture in some places) Regeneration of forests mangroves and other wetland vegetation is impeded by fires* (which are *mostly set on purpose to facilitate fishing or promote new growth of sedges, and grazing* The sand dunes south of Parottee Pond and at Thatchfield are unusual features of considerable ecological importance Important aquatic ecosystems include the rivers blue holes and ponds

Marine Ecosystems To seaward there are white sand beaches (*threatened by coastal erosion)* coral reefs (mostly small patch reefs or raised reefs close to shore) sea grass beds and mud shoals The *marine ecosystems are affected by the nutrient and pollutant plume from the Black River spear fishing and other bad fishing practices* Their status is not known

Flora (Appendix A) Ten percent of the plants of the morass are rare in Jamaica including night-blooming water lilies and other attractive species such as the Royal Palm and the Alligator Pear - closely related to the Brazil Nut Plants of economic importance include the Bull Thatch, used in basketry *The introduced Water Hyacinth is a major pest in waterways The high levels of pollutants in the Black River promote its growth and it rapidly occludes waterways Melaleuca has become established near the Middle Quarters River Extraction of lumber from the swamp forests threatens important genetic resources* Habitats of importance to rare plants include the swamp forests riverine forests riparian swale around the Styx River and ponds

Fauna Several species of global concern occur in the morass and Black River Bay, including American Crocodiles West Indian Manatees Hawksbill Turtles and West Indian Whistling Ducks *all of which require special management* including *identification and protection of critical feeding nesting and loafing habitats and enforcement of the Wildlife Protection Act* The rivers morass and the bay form the basis for an economically important freshwater fishery based on fish and shrimp Many commercially important fish spend part of their life cycles in the swamp *Pollution and disturbance of the river introduced Tilapia and Water Hyacinth and over-harvest may affect the resource but there are no data* Game birds specially White-crowned Pigeon and White-winged Dove are locally abundant Pest species including mosquitoes sand flies and sharks are also present specially along the coast *Spraying coastal wetlands with Malathion to control mosquitoes is a controversial issue*

Linkages The swamp provides many services and functions, including ground water recharge and discharge flood protection sediment retention (which protects coral reefs and marine ecosystems) biological productivity aesthetic values that support tourism provision of lumber fuel wood and forage habitat for game species etc The saline gradients formed in the river as a result of tidal action are of great importance to commercial fish and shrimp, whose life cycles include phases in the sea and in the swamp *Meanwhile coastal water quality affects productivity in the reefs and sea grass beds, and is affected by activities in the rivers and watersheds Many animals use different parts of the wetland at different stages in their lives* For example crocodiles nest on sandy beaches and berms raise their young in small ponds and streams and fish in the rivers and ponds as adults *Where animals move among different habitats at different stages of their lives, it is essential to ensure that the critical needs of each life stage are met*

Sites of Special Importance Sites of special importance include the *remnant swamp forests* along the eastern and western margins of the swamp and along the Middle Quarters YS and Black Rivers the *blue holes* on upper Broad River the areas surrounding the *upper Middle Quarters River and Styx River* and *ponds* wherever they occur, but particularly near Slipe and Cataboo (some of which are the only known locations in Jamaica for rare plants)

Parottee Ponds and Point are also of great importance Because they are divided from the rest of the Lower Morass by a road they are often considered separately, but functionally they are still closely integrated Parottee Pond includes an extensive shallow hyper-saline pond whose natural outlets to the sea have largely been blocked by a road and associated coastal development A culvert was constructed in the 1980s to reopen the link to the sea without which the natural functions and linkages of the pond (e g as a fish nursery) were much reduced *It is essential for the health of Parottee and the safety of the surrounding areas that the culvert should be maintained and no development should be allowed at a couple of locations to the east of the culvert where natural drainage sometimes crosses the road*

The ponds were originally surrounded by mangroves but most of the seaward fringe has been destroyed *This has increased the vulnerability of the area to storm damage and has destroyed critically important nesting areas for crocodiles* A large stand of red and black mangroves survives on the landward side of the pond behind which is an herbaceous wetland Mangroves can also be found

behind the berm between Parottee Point and Fort Charles There are patch reefs close to the shore

The large freshwater lake at Wallywash is another important feature It is the largest freshwater lake in Jamaica It is spring-fed and water is pumped from it to supply the local communities It provides habitat for West Indian Whistling Ducks and is used by sport fishermen, as it reportedly supports sport fish including tarpon A few subsistence fishermen also fish there using hand lines *Its integrity is potentially threatened by agriculture on the surrounding hills (which could result in eutrophication from soil erosion and agrochemicals) and excessive water extraction West Indian Whistling Ducks are hunted illegally*

Mineral Resources The mineral resources include large reserves of peat, and small reserves of silica sand and clay (EPF 3 4 3) There is no interest in commercial exploitation of these reserves at this time

6-2 4 2 Water Resources

The water resources of the Black River Lower Morass include the surface water flows of the Black, Middle Quarters, YS and Broad Rivers (all of which originate in the Cockpit Country) plus storm water which enters the morasses via the seasonal gullies on the hills around the basin The surface water is supplemented by groundwater from the Limestone Aquifer (also largely dependent on the Cockpit Country as a collection area) which forms many springs and upwellings in the morass, the surrounding hills and even under the sea To the east of the morass east lies Wallywash Pond the largest freshwater lake in Jamaica

The main issues concerning water resources have been summarized in the Water Resources Sub-Programme Controversial issues include *pollution of the Black River* (mostly blamed on Appleton) and *whether to use water from the Black River system in major irrigation schemes for southern St Elizabeth*

Deforestation in the hills around the morass is probably increasing the frequency and severity of flash flooding in the surrounding communities as well as the sediment loads of the rivers This could be exacerbated if bauxite mining is permitted in the Malvern hills Silt in the runoff may be tending to fill in some areas of the swamps changing their function and further reducing their ability to absorb and retain flood waters *Conservation of the wetland and coastal ecosystems must be planned and implemented in the context of conservation of the surrounding hills*

6-2 4 3 Cultural and Economic Resources

Cultural resources include historic and vernacular houses and other structures, including some about which written history survives (such as Vineyard) and others which are in use (such as Ashton), traditional lifestyles (such as those based on fishing in the river), and the oral tradition of the area There have been several studies of the life styles of people on the fringes of the morass Several studies have shown that many of the people in the vicinity derive some or all or their livelihood from the swamp and many of these users are engaged in traditional activities including fishers, shrimpers, thatch collectors and farmers who farm in or graze cattle in the swamp

The value of the shrimp fishery in the Lower Morass was estimated as J$48-80 M/yr and of the fin fishery about J$44 M/yr in 1998 This fishery is threatened by river pollution and habitat disturbance
Traditional crafts that support the fishing industry include making shrimp and crab pots from materials found in the swamp according to West African designs basket-making or construction of canoes from silk cotton trees *Basket-making skills are being lost because women find the activity unprofitable and the raw materials are expensive because they are in short supply*

Little has been recorded about the built environment A few examples of the traditional wattle and thatch houses with separate kitchens survive but they are rapidly disappearing *An inventory is urgently needed as is identification and protection of the best examples*

There are no published accounts of the oral tradition of the area

6-2 4 4 Recreation and Tourism

Boat tours on the Black River The main commercial focus for visitors are the boat tours on the Black River which have become increasingly commercialized over the last ten years The boat operations evolved in the absence of effective regulations and their activities threaten the resource on which they depend *The increased motor boat traffic is contributing to a decline in bird life on the river increased water, air and noise pollution with a resulting decline in the quality of the experience of visiting the river The boat tours depend on the wetland resources but do not currently contribute to their conservation* TPDCo has recently attempted to improve the management of the river but much more remains to be done (See EPF Chapter 4 and Tourism and Recreation Sub-Programme)

The use of private jet skis on the river is another contentious issue Sport fishing by boat or by hand line from the banks is popular but there are no data about the number of boats or individuals involved A commercial ostrich farm and tourist attraction was recently opened at Cashew *The nature of operations at this farm, its actual and potential contribution to conservation efforts and any environmental impacts require review*

Bathing There are public bathing beaches on Crane Road Crawford north of Parottee Pond south of Parottee Pond and at Parottee Point *The status of facilities such as change rooms and toilets on these beaches requires review The beaches of the Crane Road are eroding*

Visitor Accommodation and Restaurants There are several small hotels and many villas along the Crane Road and on the fringes of Parottee There is an extensive sub-division which extends into the wetland *Construction in this area involves removal of coastal woodland and mangroves reducing their protective and ecological functions and threatening the stability of the beach There is no central sewage system and there is a risk of marine and groundwater pollution* There are few hotels and guest houses on the other margins of the morass (except Ashton Great House) although there are many small restaurants catering mostly to locals and truck drivers

Viewpoints, scenic roads and vistas *In some areas construction obscures views and roadside garbage and badly placed signs contribute to visual pollution*

Deep Sea Fishing (See Black River Town)

6-2 4 5 Other Human Activities

Agriculture At present the only large scale agricultural activity in the area is the sugar cultivation at Holland There are several large cattle properties one ostrich farm and many small holdings *Interest in draining parts of the swamp recurs periodically but environmental studies indicate that this is infeasible*

Human Settlements Settlements around the morass are growing rapidly and there is ribbon development along the roads Centres of growth appear to include Parottee Slipe and Cataboo and Middle Quarters There is an Operation Pride site to the east of the morass and another proposed for Vineyard *There is a need for a settlement policy that concentrates housing in the urban areas facilitating provision of services and reducing stress on the landscape and environment*

Commercial Activities There are no large-scale commercial activities in or around the Lower Morass However a *pimento oil factory near Middle Quarters uses the river for waste disposal* There is a *crab packing plant at Salt Spring Vending in the cheese rock area is reportedly a problem Commercial activities in Middle Quarters are impinging on the morass*

Research and Education Although Black River has been the subject of many research programmes (mostly associated with environmental impact or feasibility studies for agricultural or mining projects) there are no ongoing large research projects The *potential for the morass to serve as a teaching tool* has never been exploited

Traditional Uses There is a long tradition of fishing shrimping and hunting in the morass (see above) Other traditional uses include extraction of lumber and harvest of thatch and other craft materials, charcoal burning The rivers springs and ponds of the morass have traditionally been used for bathing washing and swimming and

these uses continue wherever there is open water close to human habitation

Main Threats and Incompatible Uses Most of the main threats to the Black River Lower Morass have been identified above The main types of existing uses that are incompatible with sustainable use and conservation are

- river pollution resulting from the use of the river system for disposal of wastes as well as from poor land use practices which threatens river water quality contributes to growth of Water Hyacinth and kills fish and shrimp,
- excessive use of the river for boat tours and by jet skis which threatens traditional uses and wildlife,
- increasing settlements on marginal and coastal lands, which are vulnerable to disaster and whose development threatens the integrity and functions of the wetland
- cattle grazing in wetland and wetland restoration,
- excessive resource extraction (specially of timber) with no replanting and use of resources in the absence of management planning
- sand mining

Potential Incompatible Uses include

- peat mining
- excessive abstraction of water from the rivers, aquifers or Wallywash Pond for irrigation or domestic purposes, which threatens the functions of the morass the fisheries resources and the quality of the groundwater
- bauxite mining in the Malvern Hills

Past and Present Conservation Attempts The Lower Morass has been proposed for conservation many times It is a gazetted Game Sanctuary under the Wild Life Protection Act

Existing Legal and Management Framework (see legislation and enforcement sub-programme for general legislative details) Specific legislation pertaining to this area includes designation of the Lower Morass and Parottee as Game Reserves under the Wild Life Protection Act, legislation specifying approved fishing methods under the same Act and designation of several Public Bathing Beaches (Beach Control Act) and Fishing Beaches (Fishing Industry Act) The Black River (Upper Morass) Reclamation Act confers powers to clean and regulate the river

The boat tour business has sprung up in the absence of a regulatory framework It appears that the JTB is responsible for licensing boat tour operations while the TPDCo is supposed to establish standards and guidelines and ensure that they are met and the NRCA is mandated to monitor environmental conditions Other organisations with potential to control boat activities include the Port Authority (who could establish a code of conduct for operators on the river) and potentially the River Rafting Authority (whose responsibility is to control rafting in designated rivers)

Currently the majority of the morass is owned by the GOJ, and administered by PCJ Most of the morass has been declared a Game Sanctuary under the Wild Life Protection Act The limestone islands, and Parottee are privately owned and managed There is no central control of activities or planning

Table 6-2.1 Stakeholders in the Black River Lower Morass

<u>Local residents</u>
Bird watchers
Business people (shop owners restauranteurs)
Hoteliers
Householders
Hunters
Property owners and managers
Small farmers
Sport fishermen
Subsistence fishermen
Wage earners
Unemployed people
Villa owners

<u>NGOs and community-based organisations</u>
SEEA

<u>Private businesses and companies</u>
Appleton Estate (Lascelles Group)
Boat tour operators
Cashoo Ostrich Farm
Sugar Company of Jamaica

<u>Government Agencies</u>
Resource use - specific
JTB
NRCA (Game Sanctuary)
TPDCo
PCJ (wetland vested in PCJ)
Resource use - general
RADA
Fisheries Division
Division of Mines and Quarries
Pesticides Control Authority
ODP
Development planning
Commissioner of Lands
NRCA
PWD
St Elizabeth Parish Council
TCPA
Water supply and pollution control
ECD
Ministry of Water
NWC
National Irrigation Commission
Southern Parks and Markets
WRA

6-2 5 Management Strategies for Immediate Implementation

N b See Table 6-2 2 for a summary of immediate actions and suggestions about institutional responsibility

6-2 5 1 Natural Resources

Ecosystems A quick ecological assessment is needed for the whole area This should be carried out using the new aerial images which are expected to be generated by the Trees for Tomorrow Project in 1999 Comparison with 1992 images should help to clarify trends and issues

Priorities for ecosystem protection include protection and restoration of swamp forests, mangroves, riverine forests, riparian vegetation and ponds (see management plans) This programme will be more important in the Lower Morass than in other parts of the MRPA Research into the best methods of restoration will be important because most of these ecosystems are not well understood or studied and some (such as the swamp forests) are dominated by endemic species) Areas requiring special attention include Parottee Pond (whose seasonal connection to sea requires permanent protection and a moratorium on building along the coast road) Styx River upper Broad and Middle Quarters River

Interim measures such as declaration of Tree Preservation Orders for selected trees or groups of trees could help to ensure that no further degradation occurs before declaration Monitoring and enforcement will also be of great importance

Animals Priority species for this area include West Indian Whistling Ducks, sea turtles and crocodiles as well as other ducks, shorebirds and seabirds (see management plans) Monitoring of sea turtle nesting during the peak season should be considered The development of a watchable wildlife centre near Black River (see Recreation and Interpretation) should help to focus attention on wildlife conservation

Plants Special a 'ention is needed for the rare plants although in most cases protection of habitat should be sufficient Populations of rare species should be mapped and monitored and could be brought into the watchable wildlife centre for propagation if necessary Where few individuals of genetically important varieties (e g Blue Mahoe) persist efforts should be made to collect seed for propagation (e g at the Hope Gardens Arboretum)

Renewable Resources The most important resources are those associated with the wetland, specially shrimp fish charcoal fuel wood and craft materials A special project to study the ecology of the shrimps and identify possibilities for enhancement of the shrimp fishery is recommended Further work is also needed to determine options for sustainable harvest of other wetland resources specially mangroves A replanting programme for thatch should be considered

Water Resources Water will be managed at the watershed level (see Water Resources Sub-Programme) Important overall programmes include the establishment of a Black River Water Resources Council and a study of sources of aquatic pollution and appropriate mitigation measures Monitoring of simple water quality indicators should be started as soon as possible and information gathered from existing monitoring programmes Protection of the immediate watershed of Wallywash should also be considered

Mineral Resources Illegal sand mining should be eliminated and licenced sand mining carefully monitored Licences should be withdrawn if serious environmental impacts are identified Applications for new licences should be carefully reviewed to determine whether they are consistent with tourism and environmental objectives Habitat restoration should be required

6-2 5 2 Cultural Resources

Work should begin on an inventory of buildings and sites (with UTech and JNHT) Immediate action should be taken to document preserve buildings and sites which are threatened

6-2 5 3 Human Settlements

The policy for the area should see' o focus housing development in the town of Black River

6-2 5 4 Tourism and Recreation

(See Tourism and Recreation Sub-programme Public Education Public Relations and Iterpretation Sub-programme)

The development of tourism in the heritage town of Black River and the Lower Morass should proceed together This diversification of the product will greatly strengthen the tourism product

Beaches An inventory of bathing beaches should be carried out to identify which are of importance in their natural state (e g as crocodile or turtle nesting habitat) and must be left with minimal disturbance (wildlife protection areas) and which may be zoned for low or high density recreation

Boat Tours The boat tour operations require comprehensive review (including number if operators/boats design of boats and engines policy on feeding of crocodiles areas of operation quality of interpretation, monitoring, licensing boat handling etiquette effects on artisinal fishermen carrying capacity of the river and ways for tours to contribute to the management of the river system) to ensure environmental sustainability and optimal use of the resource

Tourist Accommodation The NRCA TCPD and the parish council should ensure that proposed new tourist accommodation is carefully planned with participation from the LME (once one has been identified), specially on land adjoining beaches

The possibility of a bed and breakfast programme (coordinated via the LME) should be evaluated

New Opportunities There will be many new opportunities for tourism and associated industries and crafts It is important that they should be coordinated so that resources are used sustainably and where resources are taken from the protected area some benefit accrues to it Licences may be required for specified activities The process of licencing must be open to public scrutiny The mechanism should be developed as soon as possible so that developers can seek advice at the design stage and conflicts can be minimised

6-2 5 5 Public Education, Public Relations and Interpretation

Promotion The MRPA will require a central office and the logical site will be in Black River It will therefore be well-placed to act as an information centre for recreational activities throughout the whole protected area Simple promotional materials (carefully designed to focus activities on managed areas) may be needed at an early stage

Public Education The process of public review of the EPF and the Draft Management Plan will make a very important contribution to the process of increasing public awareness and involvement in St Elizabeth It is important that the population of the Lower Morass is given the opportunity to participate fully

Interpretation A watchable wildlife pond within walking distance of Black River with interpretive displays a hide and a nature trail including a boardwalk a shop selling crafts produced from material harvested sustainably within the morass and a restaurant featuring local foods will serve as an attraction for tourists and an educational centre for school children A visible project of this type will help to demonstrate the MRPA s vision for the area and will help to win local support It will be the first and largest of many interpretation centres (mostly simple story boards) which will eventually be placed around the swamp

Other interpretive materials will include discrete and tasteful signs on the main roads at the boundaries of the park

6-2 5 6 Legislation, Regulations and Enforcement

Special efforts should be made to improve enforcement of all relevant legislation immediately to reduce p ompuve des ruction of resources Tree Preservation Orders should be gazetted as necessary NRCA Environmental Wardens will be expected to assist with enforcement New regulations of various types will be required (see Table 6-2 4)

6-2 5 7 Boundaries and Zoning

(See general text for criteria and acceptable activities in the different categories of zones) As for other areas, the boundaries will need careful to ensure that they are biologically and socially meaningful and practicable For example if possible the area should include feeding breeding and resting habitats for each threatened species

The zones will include both new categories (Table 6-2 2 and existing ones (Table 6-2 3)

6-2 5 8 Monitoring and Evaluation

Special efforts should be made to monitor incidents of illegal hunting, observed numbers of birds (specially sightings of West Indian Whistling Ducks), fish kills and pollution incidents It will also be necessary to monitor new construction sites and other developments

Table 6-2.2: Major Zones Proposed for Black River Lower Morass

CATEGORIES	SUGGESTED AREAS	NOTES
Conservation Area	Whole MRPA	Special attention to be paid to development control and law enforcement
Wildlife Protection Area	Styx River Upper Broad River Upper Middle Quarters River Selected ponds in Slipe and Cataboo area Other areas to be determined	Data on habitat use by threatened species is too incomplete to develop a complete list for this category It should include any critical habitats for threatened species (specially West Indian Whistling Ducks crocodiles and turtles) that are not covered under the following category
Restoration Area	All remnant swamp forests All remnant riverine forests Selected areas of herbaceous wetland Mangroves	
High density recreation area	Black River to Broad Water Broad Water to Salt Spring bridge Selected public bathing beaches	This category will help to reduce conflict among boat tours conservation and artisinanal fishers and between bathing and wildlife conservation
Low density recreation area	Rivers and beaches (except any zoned for wildlife protection) nature trails other areas to be identified	
Scenic routes	Main roads around morass and through Slipe and Cataboo	Maintenance and improvement of visual quality will require public education and vigilance
Private Conservation Areas	Parottee Pond and wetland Thatchfield mangroves wetland and beach	These areas are of great ecological importance and are threatened

Table 6-2 3 Areas already protected or to be declared under existing laws

CATEGORY	EXISTING AREAS	PROPOSED AREAS	NOTES
Fish Sanctuary	None	To be determined	The need for fish sanctuaries in this sub-area cannot be assessed on present data
Game Sanctuaries	Lower Morass Parottee Pond	None at present	
Tree Preservation Orders	None	To include all remnant swamp forests mangroves (specially on Broad River) trees along the Black River between Holland and Lacovia trees along Crane Road and around Parottee Pond)	This is proposed as a temporary measure to bring immediate attention to selected areas
Protected National Heritage and Monument	None	To be determined (should include typical vernacular structures)	

Table 6-2.4. Major Issues and Some Proposed Actions (Priority actions are shown in **bold**)

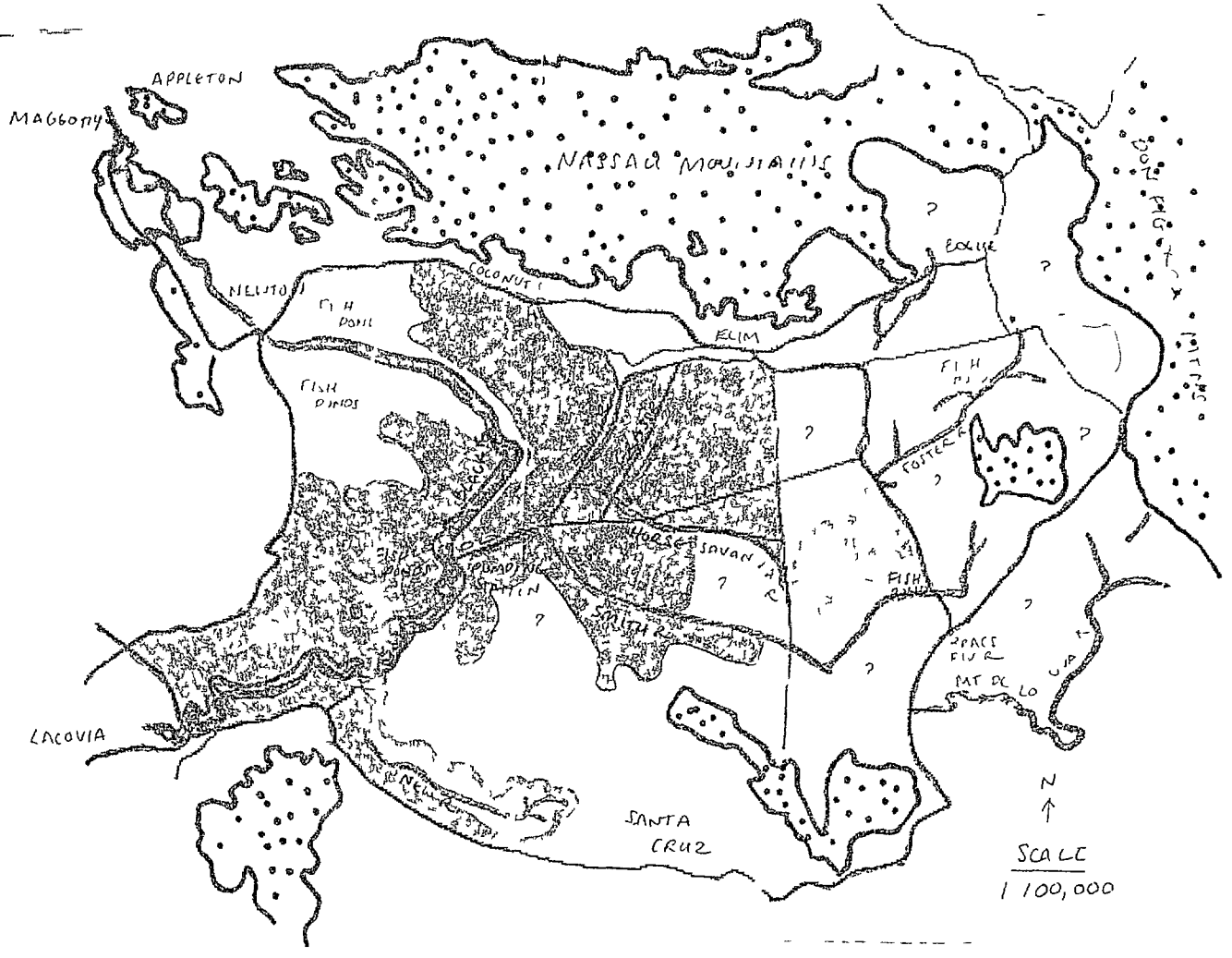
ISSUES	ACTIONS	SUGGESTED AGENCY
ECOSYSTEM AND SPECIES CONSERVATION AND RENEWABLE RESOURCES		
Lack of ecological data and current maps	- Seek funding for REA - Seek funding to continue West Indian Whistling Duck surveys	NRCA NPPA/LME West Indian Whistling Duck Working Group of Society for Caribbean Ornithology (Ann Sutton)
Some ecosystems require restoration	Provide interim protection - Develop restoration techniques	NRCA NPPA/LME/TCPD
Some plants may need propagation	Monitor rare plants and collect for propagation if necessary	NRCA NPPA/National Arboretum Foundation
Lack of management strategy for shrimp fishery	Seek funding for ecological study and management strategy	NRCA/Fisheries Division/LME/Shrimp Higglers Association
WATER RESOURCES		
Irrigation	Participate in **discussions of proposed irrigation schemes** as necessary	NRCA

Water pollution	**Continue discussions with main polluters about practical short term measures** **Monitor pollution incidents and simple parameters**	NRCA - Warden
LEGISLATION REGULATIONS AND ENFORCEMENT		
No protection for forests	**Provide interim protection using Tree Preservation Orders**	NRCA/TCPA
Destruction of resources	**Improve monitoring and enforcement of existing laws**	NRCA/ Parish Council
Unlicenced tour operators on river	Get Black River designated under River Rafting Act if appropriate **Require all operators to have current licences**	TPDCo
Jet skis and unlicenced boats damage river and disturb other users	Develop legislation to ban jet skis Require all users of the river except artisinal fishermen to have licences	NRCA
Illegal hunting	**Improve monitoring and enforcement**	NRCA - Warden
Building too close to swamps and sea	**Ban any filling or draining of wetland** **Develop legislation for minimum set backs**	NRCA
HUMAN SETTLEMENTS		
Solid wastes disposal in mangroves beaches	Seek root causes Improve public education Publicise alternatives **Clean up campaigns**	NRCA/SEEA/South Coast Resort Board/others?
Building in swamps and on beaches	**Moratorium on building south of Parottee** Develop regulations for minimum set back for new structures	
Reduction of public access to seashore	Encourage citizens and NGOs to consider group purchase of undeveloped lots for conservation	Candidate LME
Divestment of marginal lands around wetland for housing Agricultural squatting on marginal lands	**Request Lands Department not to divest any land in or near the lower Morass** Monitor land use	NRCA NPWA NRCA Warden
TOURISM AND RECREATION		
Negative impacts of boat tours	**Comprehensive review of environmental and social aspects of boat tours and development of strategy**	NRCA/TPDCo/LME/South Coast Resort Board

Carrying capacities of river beaches reefs other resources not known	Commission studies as necessary	NRCA/TPDCo/LME/South Coast Resort Board/Developers
Scenic routes marred by rubbish signs and unimaginative development	Enforce laws re roadside signs Educate public about visual pollution	Parish Council NRCA
PUBLIC EDUCATION AWARENESS AND INTERPRETATION		
Lack of a shared vision for the future of the Lower Morass	**Work with stakeholders to develop a vision for the proposed protected area**	NRCA/candidate LME
Lack of awareness and public support	**Public consultations re EPF and draft management plan** Begin project development of watchable wildlife pond	NRCA/South Coast Resort Board West Indian Whistling Duck Working Group of Society for Caribbean Ornithology (Ann Sutton)

BLACK RIVER UPPER MORASS MAJOR ECOSYSTEMS

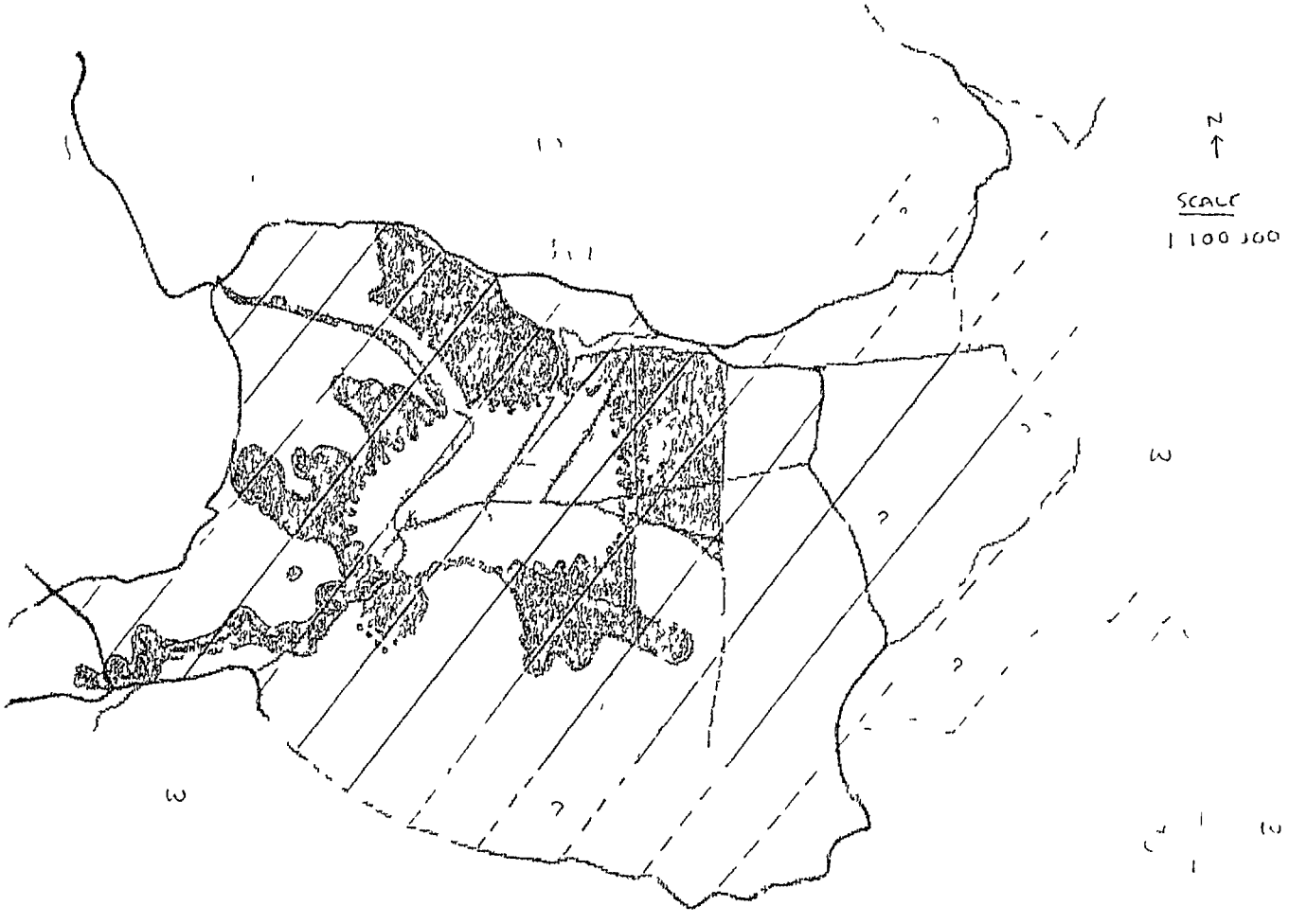
N b The ecosystems of this area have never been scientifically studied



KEY TO NATURAL HABITATS			
	MARINE		WETLANDS
	Coral Reef		Herbaceous Wetland
	Coral and Sand		Mangrove
	Sand		Swamp Forest
	Sea Grasses		Rivers ponds and lagoons
	TERRESTRIAL		MELALUECA (to be determined)
	Agriculture PASTURE SUGARCANE		
	Coastal Woodlands		
	Dry Limestone Forests and Limestone Islands		
	Riverine Forests		

BLACK RIVER UPPER MORISS DRAFT ZONING AND BOUNDARIES

NB These draft boundaries are presented for discussion only
There are no current vegetation or topographic maps for this area



KEY TO PROPOSED ZONES			
/ /	Conservation Area	to be determined	Low Density Recreation Area
	Wildlife Protection Area		Scenic Routes
	Restoration Area		Private Conservation Area
	High Density Recreation Area	W	WATERSHED CONSERVATION (OUTSIDE
?	NO DETERMINATION POSSIBLE - DATA INCOMPLETE		PROPOSED BOUNDARY)

6-3 BLACK RIVER UPPER MORASS - SUB-AREA PLAN

6-3 1 Introduction

The Upper Morass is the middle basin of the Black River system It lies between the upper watershed (including the Cockpit Country and the plains of Appleton) and the lower morass The Upper Morass has been significantly altered from its natural state (which was never described) by drainage cutting and clearing Nevertheless it retains many of its natural functions Despite having high potential for low-impact alternative tourism the Upper Morass remains infrequently visited

6-3 2 Objectives for the Subarea

The objectives for the subarea include

- Restoration and enhancement of natural functions resulting in benefits for the local and downstream (lower morass) areas,
- Protection of threatened species especially West Indian Whistling Duck, crocodiles Jamaican Slider, water birds and native ducks, and
- Improved quality of life for local residents through sustainable tourism, agriculture and fisheries

6-3 3 Existing Conditions

6-3 3 1 Natural Resources and Resource Harvest

With the water from the upper watershed comes pollution including sugar wastes from Appleton agricultural run off leachate from the old Maggotty alumina plant Despite changes in drainage patterns, it still retains its natural function as a settling basin protecting the lower morass from floods and siltation

Many of the drained sites have mostly been abandoned and have reverted into wetlands of considerable biological importance How important they are is not known, because the ecology of this area has never been assessed or described

Today the core of the area is an herbaceous wetland dominated by grasslike sedges dissected by rivers streams and canals and punctuated by small permanent and seasonal ponds The Black River has been more or less separated from the central and eastern morass by dykes and many of the rivers in the western morass have been canalized The two systems join at the defunct pumping station There are a few limestone islands West of the Braes River and to the south of the morass there are large areas of sugar cane, while south of Elim the land is mainly ruinate pasture on abandoned rice fields

6-3 3 2 Ecology, Ecosystems and Species

Main Ecological Linkages

- The upper morass protects the lower morass from siltation and pollution by acting as a settling basin, and a pollution and nutrient sink Many threatened and economically important animals probably move between the two basins to seek food or nesting or nursery habitat
- The upper morass acts as a catchment basin, recharges aquifers and protects the lower morass from flooding, thus protecting marine ecosystems as well

Lack of Baseline Data

- There are very few data on the ecology, no descriptions of ecosystems functions or distribution and no assessment of species, with the exception of a preliminary study of the West Indian Whistling Duck The topographic maps are out of date In the absence of these data it is impossible to design the boundaries or to develop a zoning plan

Alteration of Habitats

- Channelization of the Black River has changed its relationship with the eastern morass
- Most of the other rivers have been changed into canals and new water courses constructed

- The rice fields and fish farms that were created in the 1970s and 1980s have been mostly abandoned Hundreds of acres of land have reverted to swamp Some parts have been divested leased or captured for sugar cultivation Expansion of sugar into unsuitable lands and squatting on swamp lands threatens wildlife

Threatened Species

- Preliminary surveys show that the Upper Morass includes the best habitat for West Indian Whistling Ducks so far identified in Jamaica and possibly some of the best habitat in the Caribbean Other threatened species including crocodiles are present but data are incomplete
- No data are available about the distribution or status of endemic fish
- Two possibly extinct species (the Jamaican Rice Rat and the Giant Gallywasp) and on endemic race (the Uniform Crake) might survive here No searches for these species have ever been conducted
- At least three rare species of rails (Spotted Rail, Black Rail and Yellow-breasted Crake) occur here

Invasive and Introduced Species

- Water Hyacinth is a pest in the waterways many of which are blocked The positive side is that it may also help to remove contaminants from the rivers and could possibly be used as a raw material for crafts
- An invasive tree species (Melaleuca) has become established and is spreading Control measures are urgently needed
- No data are available about the effects of introduced Bullfrogs although they are known to have become established
- Introduced fish including Tilapia have become established and now form the basis for the fishery

6-3 3 3 Harvest of Renewable Resources

Fishing The native fish species of the area have been largely replaced by Tilapia Fishermen use hand lines and pots for fish and shrimp and report good catches At least four fish or shrimp farms have been established in the upper morass but only one is operational The outflow from the fish farm is a favoured spot for local fishermen

Hunting Hunting of columbids and ducks was popular in the area before it was declared a game sanctuary It still continues in and out of season The scale and impacts of illegal hunting are not known

Pest control Egrets and herons are among species that are shot in pest control operations at fish farms

Cattle Grazing

- Cattle are grazed throughout the morass They probably trample and disturb the nests of ground-nesting birds Grazing affects species composition and inhibits regeneration of natural vegetation
- Fires are set in the morass probably to create grazing and improve access The impacts are similar to those of grazing

6-3 3 4 Other Human Activities and Impacts

Human Resources and Settlements No data are available

Cultural Resources No data are available

Tourism and Recreation The upper morass is regularly visited by bird tours and small numbers of bird watchers Other uses include sport fishing and hunting (see above)

Water Pollution

- Severe pollution in the form of untreated dunder enters the morass via the Grass River which becomes black and very offensive when rum is being distilled at Appleton This pollution is carried into the Elim River and thence to the Black River Both rivers are eutrophic Research is needed to assess other sources of pollution (including the abandoned Maggotty alumina which is being converted to a lime plant) and the r effects
- Fish kills are apparently associated with seasonal peaks in release of dunder from Appleton
- The groundwater is polluted by caustic soda and other residues that leach into it from the unsealed red mud lakes at Nain

Solid Wastes Solid wastes are dumped along road sides at various points in the swamp including near Elim and New River

Soil Erosion The ranges of hills surrounding the upper morass are currently moderately well forested and neither the aerial photographs nor an over flight in 1998 suggested that deforestation is a major problem Increased deforestation of the watershed would severely affect both upper and lower morasses

Natural Disasters After heavy rainfall large areas of the morass may be flooded

6-3 3 5 Incompatible Resource Uses

The following actual or proposed uses of the Upper Morass are incompatible with its conservation

- Conversion of wetland into agricultural land
- Grazing cattle on sections of the wetland that are of importance to threatened species
- Duck hunting in wetlands,
- Deforestation or mining in surrounding hills and upper watershed,
- Use of rivers conduits for waste disposal

Table 6-3.1: Main Stakeholders in Upper Morass

Local residents Hunters Business people (shop owners) Property owners and managers Small farmers Sport fishermen Subsistence fishermen (from local villages Santa Cruz Lower Morass and as far away as Negril) Wage earners Unemployed people	Government Agencies **Resource use specific** Forestry Department (Bogue Reserve) Coconut Industry Board (Barton Isles) Coffee Industry Board (Maggotty Factory) Elim Agricultural School NRCA (Game Sanctuary) **Resource use - general** RADA Fisheries Division Division of Mines and Quarries Pesticides Control Authority ODP **Development planning** Commissioner of Lands NRCA PWD St Elizabeth Parish Council TCPA **Water supply and pollution control** ECD Ministry of Water NWC National Irrigation Commission Southern Parks and Markets WRA
NGOs and community-based organisations No data	
Private businesses and companies Alpart Appleton Estate (Lascelles Group) Jamaica Broilers Sugar Company of Jamaica Bird tour companies	

6-3 3 6 Previous and Current Conservation Measures

- Upper Morass Game Sanctuary (Wild Life Protection Act) includes core area of morass
- Bogue Forest Reserve (Forests Act) included primary forest Current status not determined

The Black River (Upper Morass) Reclamation Act remains in effect despite the clear physical and economic failure of the reclamation The Act conflicts with the objectives of the protected

6-3 4 Proposed Management Sub-programmes

The main aims are to protect threatened species to enhance natural functions (including nutrient retention and flood control) increase tourism value of wildlife, increase fisheries The first priority is to commission a rapid resource assessment of the entire Upper Morass basin (including mapping from aerial photographs) This will form the basis for more effective planning

6-3 4 1 Protection and Conservation

Biodiversity Conservation

- Creation of a West Indian Whistling Duck Reserve This will accommodate their complete lifetime habitat needs an interpretation centre
- Management of other threatened species (including crocodiles, coots crakes and rails)
- Development of management plans as necessary (starting with duck)
- Strict control of hunting grazing and squatting

Habitat and Resource Restoration

Clean up measures for the Grass Elim and Black Rivers
Restoration of swamp forests and reed beds
Control measures for Melaleuca

Resource Harvest No data are available about the use of resources other than fish Possibilities include craft materials and medicinals Guavas and logwood grow abundantly along the dyke roads and on ruinate pastures around the morass but no data is available about harvest If important resources are identified they should be assessed and managed if necessary

Mineral Resources Limestone or bauxite quarrying in the watershed should only be permitted if there it will not degrade the catchment or the landscape

Water Resources Reduction of water pollution (specially from Appleton) is the most important and controversial issue to be addressed The Water Resources Sub-Programme document describes the main strategies

6-3 4 2 Interpretation and Awareness

This subject area involves many different types of activities with complementary objectives which are treated in more detail in the overall report Only the activities specific to this area are listed below

The West Indian Whistling Duck Conservation and Education Centre will be the main focus of this programme Ideally it would provide a focus for West Indian Whistling Duck conservation in Jamaica A display centre would be developed to service both tourists and the general public Hides displays and story boards would provide the opportunity to see ducks and many other species in their natural habitats and inform visitors about the importance of ducks and their wetland habitats This would complement a similar centre which is proposed for the Crane Road near Black River The Upper Morass Centre would focus on mainly freshwater issues while the Lower Morass Centre would deal with coastal issues and mangroves Development and implementation of a project of this sort that integrates conservation education and tourism in a highly visible way is likely to be the best way to create interest in conservation of the Upper Morass People are more likely to get actively involved in committees and councils when they have something practical to discuss

6-3 4 3 Tourism and Recreation

This area has many options for tourism development Its advantages

include an impressive landscape many water courses (some of which might be modified to enhance their recreational potential) and abundant wildlife The system of dyke roads provides access to the swamp, in a controlled fashion Roads can be opened to the public or gated and guarded to restrict access as necessary The canal and dyke system provides some means to control water levels Options for development include a West Indian Whistling Duck Conservation and Education Centre with hides and trails for watching ducks and other wildlife which could also function as a tourist attraction, generating revenue for conservation There are many possibilities for outdoor activities including sport fishing canoeing, hiking and bicycling River bathing would be an attraction, but cannot be considered until pollution has been controlled

None of these options should be entertained without conservation of the entire area nor can the best strategy be determined until an EIA and mapping exercise has been completed It is recommended that a tourism strategy should be developed by a multi disciplinary team including an ecologist a tourism planner and local people, in order to avoid the types of problems encountered in the Lower Morass *Inter alia* the plan should ensure that tourism activities subsidize conservation (rather than the other way round) that carrying capacity studies are carried out before licences are granted and that local communities have a chance to participate and benefit from tourism

Where to start
- Develop tourism strategy
- Institute strict controls to ensure that no tourist activities begin operating without licences

6-3 4 4 Legal Framework

Establish regulations for zones and make appropriate arrangements with Commissioner of Lands

Enforcement Initial enforcement will focus on control of hunting (specially during the hunting season) squatting and of dumping Enforcement of laws about pollution must be a priority as the high levels of pollution in the Black River needs attention but it is recommended that the management authority start by negotiating with offenders about phased reduction

Boundaries and Zoning The outer boundaries should be determined following a quick ecological survey of western morass and further work on ranges and habitat use by important species (specially West Indian Whistling Duck)

The plan for boundaries for the Upper Morass cannot be completed until the eastern margins of the morass have been evaluated The present Black River Upper Morass Game Sanctuary will be incorporated into the area The Bogue Forest Reserve has also been included

Proposed Zones
- High intensity recreation area None
- Low intensity recreation area
  - West Indian Whistling Duck Conservation Centre
  - Selected roads rivers and canals
- Restoration area
  - Whole core area abandoned fish farms
- Wildlife protection area
  - Around pumping station and other important wildlife areas
- Private conservation area
  - To be determined
- Conservation area
  - Rest of area
- Scenic route
  - All main roads around morass

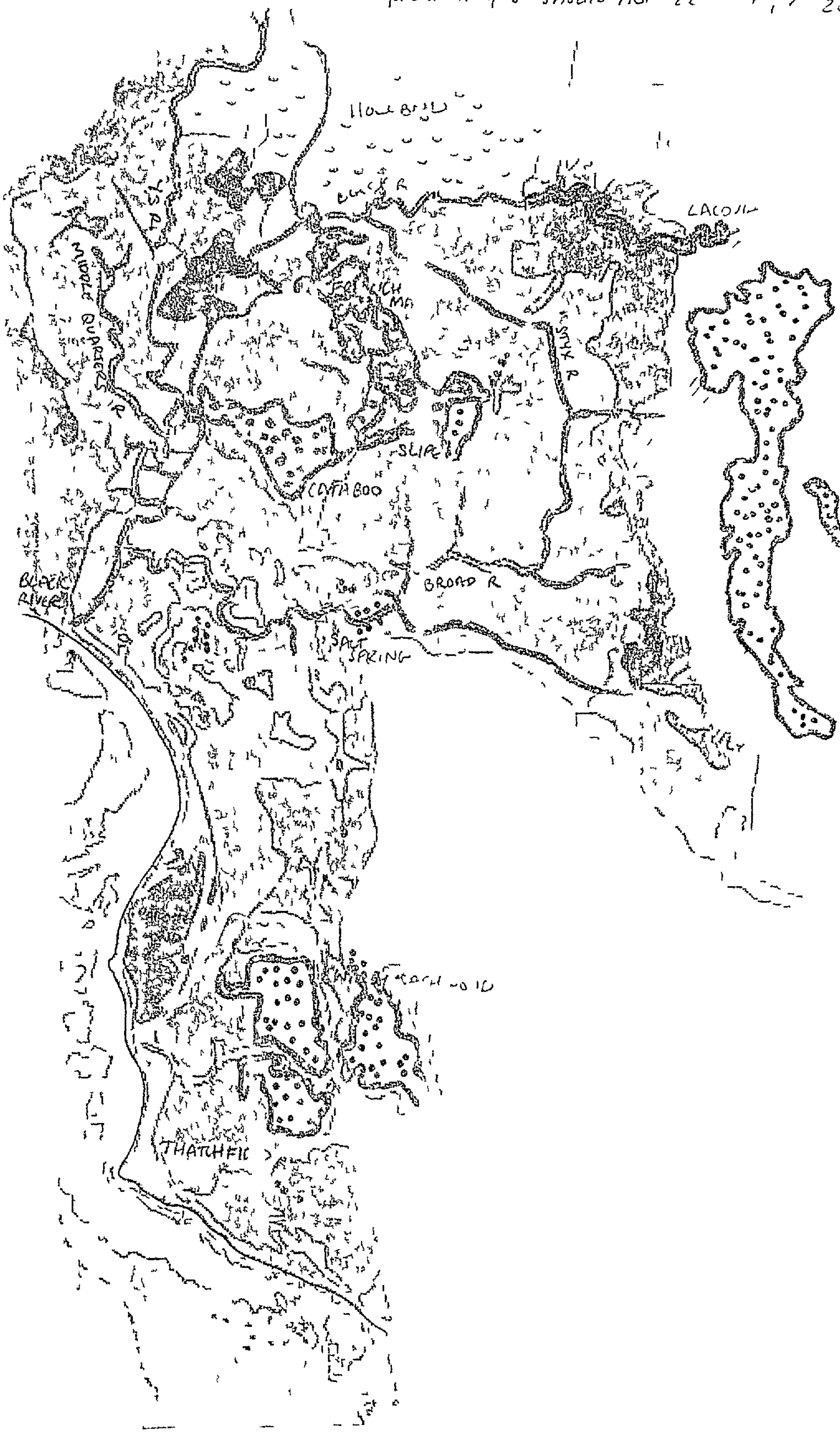
Monitoring and Evaluation Special efforts should be made to monitor incidents of illegal hunting observed numbers of birds (specially sightings of West Indian Whistling Ducks), fish kills and pollution incidents

Table 6-3-2 Priority issues and suggested actions

Issues	Actions	Suggested Agency
Lack of ecological data and maps	Seek funding for REA Seek funding to continue West Indian Whistling Duck surveys	NRCA/LME West Indian Whistling Duck Working Group of Society for Caribbean Ornithology (Ann Sutton)
Water pollution	Continue discussions with main polluters about practical short-term measures Monitor pollution incidents and simple parameters	NRCA - Warden
Illegal hunting	Improve monitoring and enforcement	NRCA - Warden
Divestment of wetlands and marginal lands around wetland for agriculture (e g sugar) Agricultural squatting on marginal lands	Request Lands Department not to divest or allow squatting on any more land in Upper Morass Monitor land use	NRCA - NPWA NRCA - Warden
Lack of awareness and public support	Begin project development for West Indian Whistling Duck	West Indian Whistling Duck Working Group of Society for Caribbean Ornithology (Ann Sutton)

BLACK [illegible] MAJOR ECOSYSTEMS

NB This map [illegible] collected in 1982 (except [illegible] URCA (1977) It must be [illegible] preliminary & should not [illegible] zoning



N ↑

SCALE 1 100,000

	KEY TO NATURAL HABITATS
	MARINE
	Coral Reef
	Coral and Sand
	Sand
	Sea Grasses Sea grass & coral
	TERRESTRIAL
	Agriculture
	Coastal Woodlands
	Dry Limestone Forests and Limestone Isla
	Riverine Forests
	[illegible]
	WETLANDS
	Herbaceous Wetland
	Mangrove
	Swamp Forest
	Rivers ponds and lagoons
	RESORT [illegible]
	[illegible]

BLACK RIVER LOWER MARSH DRAFT ZONING & BOUNDARIES

N.b These draft boundaries are presented for discussion only. Discussion of zoning categories and field surveys as well as consultation with adjoining owners are needed to determine boundaries

N

↑

SCALE

1 100,000

KEY TO PROPOSED ZONES	
	Conservation Area
	Wildlife Protection Area
	Restoration Area
	High Density Recreation Area
	Low Density Recreation Area
	Scenic Routes
	Private Conservation Area
	Interpretive Site
	Shore Trails

6-4 MIDDLE QUARTERS/LACOVIA CORRIDOR

6-4 1 Introduction

The Middle Quarters-Lacovia corridor is on the main route from Kingston the Negril, the A2 Lacovia is a village at the Black River bridge and the junction of the A2 with the roads to Maggotty and Treasure Beach It extends along the main road for some distance to the east but to the west is contained by the beginning of the Holland Bamboo Avenue Middle Quarters lies a short distance southwest of the Bamboo Avenue at the junction of the A2 with the road to Montego Bay via Newmarket

Since most long-distance travellers by-pass the town of Black River via the secondary road from Luana to Crawford route this corridor between the Black River Upper and Lower Morasses provides a high volume tourist experience, a visual introduction to the special morass environment and a potentially important point of entry to the two morasses

6-4 2 Objectives for the Area

The objective for this area is for the corridor s potential as the central gateway to the proposed Protected Area to be recognized and achieved Local residents and the upper and lower morasses should be the beneficiaries of the corridor's new role and image

6-4 3 Existing Conditions

6-4 3 1 Natural Resources

Above Lacovia the Black River leaves its upper basin and flows through a narrow gorge for 2-3 kilometres amid tall and attractive riverine forests before entering the Lower Morass basin

The northern sections of the lower morass around Lacovia have been much altered by drainage and agriculture There are several remnant ponds and oxbows north and south of Lacovia but most of the land is agricultural The famous Bamboo Avenue marks the northern extent of cane cultivation on the Holland estate

Below Lacovia the narrow fringe of riverine forest continues as the Black River runs through cane fields and pastures and in some places the banks of the river are dyked Gradually the extent of the herbaceous wetland on the south bank increases Near Holland Pumping Station and between Middle Quarters and YS Rivers as well as along the western margins of the swamp between Baptist and Luana, there are remnant patches of Swamp Forest These forests are of great visual and botanical interest and deserve protection and restoration

The YS River is the longest tributary of the Black River It originates in the Cockpit Country and flows into the Lower Morass near Shaws at the end of Bamboo Avenue At Middle Quarters it runs close to the road but its potential scenic qualities have not been exploited Between this point and its confluence with the Black River it is often blocked by weeds

The Middle Quarters River is another major tributary on the west of the morass A rafting enterprise was started (without the benefit of a planning application or environmental impact assessment) at the head of this river

6-4 3 2 Cultural and Historic Resources

Lacovia has a history that needs to be further researched and publicized The Lacovia area has been a traditional crossing of the Black River since the days of the Taino Following their trails the Spanish crossed the area with their road connecting the north coast (Rio Bueno) and the south coast (Pedro) It is noteworthy that the Myal and Gumbay cultural complexes are to be found in and around Lacovia However no detailed investigations have been undertaken to detect signs of these early inhabitants

The original Spanish capital of the region Lacovia was one of the major points of resistance by the Spanish against the English It was here that the Black Spanish soldier Diego Pimiento immortalized himself by single handedly protecting the Lacovia ford from advancing English soldiers The sites of skirmishes and battles in

1655 between the Spanish and the English can be identified nearby Lacovia became the first English capital of St Elizabeth In 1774 Edmond Long noted the town s existence and the fact that it was the capital He described it as a Jewish town of 12 - 14 houses a court house and two taverns The capital was eventually removed from Lacovia due to the growth of Black River as a town of major size and economic importance

Lacovia is today an important small town of the area which retains some historic structures as well as two JNHT listed tombs at the junction of the main road and the Lacovia to Balaclava road As described in the Statistical Yearbook of Jamaica

> "At Lacovia on the main road are two tombs - the spot is called Tombstone One is without inscription but the other a high brick tomb has a massive marble slab inscribed to Thomas Jordan Spencer, born October 14th, 1723 and died September 17th, 1738 Tradition has it that at a tavern which formerly stood hard by a friendly party was interrupted by angry words which led to a duel in which both combatants were killed and were buried side by side What is interesting about this tomb however is that the coat-of-arms engraved on the marble slab is that of Spencer or Aldrop Charles Spencer, Earl of Sunderland, married the second daughter of John Churchill first Duke of Marlborough their son became the second Duke an ancestor of the present Duke and the late Sir Winston Spencer Churchill "

In an interesting commentary on the manner in which much history is buried or overlooked this historical site now lies cunningly concealed in a gas station forecourt (Black River Report for A System of Natural Protected Areas for Jamaica 1990) These and other historic tombstones near the roadway beside gas station are subject to graffiti They need cleanup protection and installation of interpretive plaques

It is probable that other sites or aspects of the area s history could be uncovered and presented profitably as points of interest for the traveler Certainly the area contains a number of g eat houses which offer potential for reuse Several buildings in Lacovia have historic and architectural interest and need sensitive maintenance and eventual restoration The complex of shops beside the old bridge at Lacovia is a particularly attractive group of old buildings in a good location No longer operated as shops the structures are deteriorating

Until recently (?) an old sign proclaimed the fact that Lacovia once won a competition for most beautiful town in Jamaica Today the community is a place that travelers drive through but do not stop in Its intrinsic and potential value as a site of enjoyment and interest for residents and tourists needs new recognition and revival

Bamboo Avenue at Holland has long been part of Jamaica s tourism product Now managed by the Superintendent of Gardens in the Ministry of Agriculture the five-mile long avenue is in need of renovation and care Once a dense planting of double rows of bamboo the avenue has been reduced to single bamboos on each side in long stretches and there are gaps in the single rows in several places

While the avenue is still a spectacular scenic drive it has lost much of the once awe-inspiring tunnel appearance that has been a well-known tourism advertising image The cause is a combination of natural attrition deliberate burning in acts of protest and arson and the absence of a replanting programme (There seems to be no natural regeneration of the bamboo) The apparent loosening of restrictions on use of the avenue has led to large numbers of stalls being constructed (20 squatter stalls and three shops were counted in June 1998) These are being taken over by squatters selling fruit which increases the danger of further degradation by fire litter and general overuse Control is urgently needed if Bamboo Avenue is not to degenerate completely into Bamboo Arcade Twenty squatter stalls and 3 shops were counted there in June 1998 In the past Holland Estate offered to take over management at no cost but this offer was rejected As a result Bamboo Avenue has continued to decline

Middle Quarters Middle Quarters itself is potentially a very attractive village with an interesting history However the possibilities of the site (the fresh water springs and streams beside

the road the views of the wetland attractive vernacular architecture the crossroads square etc) are not being acknowledged and featured in the present development of the area

The pepper shrimp sold on the roadside at Middle Quarters is part of the local tradition of a visit to or travel through St Elizabeth Many vendors spend up to 12 hours a day on the roadside - a hazardous and unhealthy lifestyle The vending activities extend along the main road As traffic increases it becomes hazardous for purchasers and other road users too

The visual quality of Middle Quarters is declining rapidly The concrete and steel vendors sheds provided by UDC about 15 years ago have mostly become unusable, but remain as eyesores Meanwhile many people are taking advantage of the Parish Council s *laissez faire* attitude to squatters on the road right of way to construct increasingly substantial buildings including bars restaurants and even a car wash (!) Many new buildings are on the edge of the swamp and block potentially attractive views of the swamp

6-4 3 3 Incompatible Resource Use

The morass adjacent to the corridor is impacted by agricultural chemicals and by sewage from the town towns Industrial wastes include the effluent from two pimento factories that are discharged into the Middle Quarters River and the leaves that are piled on the banks

Replacement of indigenous houses with distinctive styles with modern concrete structures is fundamentally incompatible cultural resource use that conflicts with any effort to build a community tourism product

6-4 4 Suggested Actions

6-4 4 1 Tourism and Recreation

The corridor offers great possibilities as the base for walks and the enjoyment of wildlife in beautiful surroundings with fine view points

Lacovia is a base from which the following can be explored

- the Lacovia Gorge -- short hike (guided or with controlled access *points and patrols)*
- the Black River Upper Morass via the Lacovia Gorge - needs access via
- attractive ponds for bird watching and fishing small freshwater ponds for resident ducks
- the Lower Morass via the Slipe Road

There is no tourism in the Upper Morass at present A tourism specialist and an ecologist should work together to prepare a master plan to guide future activities in the Upper Morass and their links in Lacovia

Options are expected to include low density tourism, including boat trips originating from an interpretation and activity centre possibly in the old shops by Lacovia old bridge bird watching and hiking on the dyke roads a West Indian Whistling Duck interpretation centre at Elim canoeing on selected rivers and streams

The Cashoo Ostrich Farm and Park can make more residents and visitors aware of Lacovia Improvements in Lacovia can in turn expand the market for the commercial attraction

Bamboo Avenue Action is needed by the Superintendent of Gardens to control the vendors and replant the avenue

Middle Quarters can become recognized as a base for exploring the Black River Lower Morass (rafting swamp forest visits and interpretation) and for reaching YS and walks to Cockpit Country

Necessary actions to improve Middle Quarters include the following

- Old unused UDC stalls should be removed
- New illegal permanent structures should be given notice to remove them The structures should be taken down (not

bulldozed into the swamp) if necessary
- The vendors should be encouraged to find ways to better their working conditions and helped to implement them,
- Consideration should be given to some "beautification e g planting attractive swamp vegetation (such as Royal Palms) along the roadside However seedlings should not be taken from the swamp the possibility of strategic clearing of vegetation to open up views of the river and blue holes close to the road should also be examined
- A design competition
- A display of before and after photographs and a table display in the square
- Replacement of indigenous houses with distinctive styles with modern concrete structures

6-4 4 2 Research

Ecological assessment -- see Sub-area Plans for the Lower Morass (Chapter 6-2) and the Upper Morass (Chapter 6-3)
West Indian Whistling Duck status and habitat use (see Upper Morass)
Water pollution sources and remedies study

6-4 4 3 Administration

Establish users councils
- Cane farmers and other agriculturalists
- Fish farmers
- Crafts

6-4 6 Boundaries and Zoning

If eco-tourism is to be expanded successfully in the MRPA the quality of the overall area must be protected Travellers and tourists are more likely to want to take boat rides guided hikes or birdwatching tours if the built environment they pass through or start off from is attractive and if the natural areas they pass through are uncluttered by insensitive reminders of human occupation and use

This means that it is essential to

- look at existing settlements with fresh and critical eyes (if possible the discriminating traveller s eyes)
- protect both grand vistas and smaller but interesting views of natural features and vegetation
- find ways of conserving large tracts of land in their natural or lightly humanized state and
- give attention to the immediate surroundings of features of historic and cultural interest so that visits become pleasant experiences

The zone will overlap with the Lower Morass to the south and the southeastern corner of the Upper Morass However it requires a special overlay because of the need to protect the visual quality of the corridor sources of impact on the morass and opportunities for sensitive and profitable gateway development

The corridor should include the main road from its intersection with the Barton Isle road in the east to Baptist in the west (and all the way to Black River) and should be designated a scenic route The corridor should therefore include all areas visible from the road on either side (A survey of the visual corridor will be needed to determine the boundaries)

The corridor should also include the entire length of the Black River Gorge to the north from the bridge to the flatland of the Upper Morass and the riverside and structures to the south of the bridge to the point where the river and the Slipe Road diverge These areas are outside the visual corridor of the road but are critical to the development of an economically-productive community and nature tourism base for the area For the same reason the entire community of Middle Quarters needs to be included Consideration should also be given to inclusion of the Burnt Savanna road from Lacovia to Cashew because the success of the Cashoo Ostrich Farm and Park could trigger roadside development

Habitat/cultural/visual protection areas should include

- Scenic Route
  - A2 from Barton Isle road intersection to Black River
  - All roads turning off the A2 for a distance of 1 kilometre

Lacovia
  - Middle Quarters
- High intensity recreation area Bamboo Avenue
- Low intensity recreation area
  - Rivers and accessible parts of Upper and Lower Morass (see Sections 6-2 and 6-3)
- Habitat restoration area
  - Lower Morass fringe to the east and west of Middle Quarters
  - Lacovia Gorge
- Habitat Conservation area
  - All swamp in Upper and Lower Morass
- Interpretation Centre Explore the potential for developing the complex at Lacovia Bridge as a craft centre or possibly as an for the northern morass

In addition to the proposed zoning and scenic corridor recommendations it is possible that modifications to the boundaries of the MRPA should be made so to preserve the western bank of the river system and the conservation area morass to the west of the town

6-4 6 Legal Framework and Enforcement

On the northern side, the corridor should be treated as a buffer zone for the proposed BRMRPA where existing requirements for permits for new structures, removal or modification of structures, erection of signs, tree removal, etc would be very strictly enforced and where review by the LME (or sub-area Council or Local Advisory Committee) would be required in addition to Parish Council approval

Development on the morass side of the main road from Middle Quarters to Black River must be kept in check

Scenic route regulations should be included in the Managed Resource Protected Area regulations and in the new St Elizabeth Development Order

Table 6-4 1 Main Stakeholders in the Lacovia Middle Quarters Corridor

Local residents

Business people (shop owners)
Bird watchers
Hunters
Property owners and managers
Householders
Small farmers
Sport fishermen
Subsistence fishermen (from local villages)
Wage earners
Unemployed people

NGOs and community based organisations

Neighborhood Watch
SEEPA

Private businesses and companies

Appleton Estate (Lascelles Group)
Sugar Company of Jamaica
Bird tour companies
Boat tour companies
Rafting tour company
Cashoo Ostrich Farm

Government Agencies

Resource use specific

Forestry Department (Bogue Reserve)
Coconut Industry Board (Barton Isles)
Coffee Industry Board (Magotty Factory)
Elim Agricultural School
NRCA (Game Sanctuary)
JTB
TPDCo
PCJ (wetland vested in PCJ)
JNHT

Resource use - general

RADA
Fisheries Division
Division of Mines and Quarries
Pesticides Control Authority
ODP
Police

Development planning

Commissioner of Lands
NRCA
PWD
St Elizabeth Parish Council
TCPA

Water supply and pollution control

ECD
Ministry of Water
NWC
National Irrigation Commission
Southern Parks and Markets
WRA

6 5 BLACK RIVER TOWN SUB-AREA PLAN

6-5 1 Introduction

The town of Black River lies at the mouth of the Black River on the western bank It s extent is still relatively compact although residential development has extended along the Crane Road shoreline to the east and in a series of subdivisions to the northwest The town is an important heritage site with potential for development as a center of heritage and nature tourism (see draft EPF Table 21)

6-5 2 Existing Conditions

6-5 2 1 Cultural and Historic Resources

The Black River area was first settled prehistorically by the earliest phase of Amerindian settlement in the island between 600 and 900 AD From the time of the Spanish the Black River (Rio-El Caovano) was important for shipping mahogany and "chocolate" (cocoa) although it is not known if they had a town at its mouth

English settlements began to extend along the south coast in the later 17th century In 1675, a large group of English settlers came from Surinam following that colony's exchange with the Dutch for New York and established "Surinam Quarters" west of Black River Bay The town of Black River could quite conceivably have begun its development in the early 18th Century However, the first documentary evidence comes from the latter half of the century Historian Edmond Long describes the church and a sketch of the town in 1780 shows it extending from west of the river bank

A major transhipment port for sugar, rum annotto and pimento which were brought to it down the Black River the town came to particular prominence in the 19th Century as logwood dye became a most important export product In its heyday Black River was regarded as the second most important town in Jamaica The prosperity brought by the logwood trade in the later 19th Century was reflected in the fact that the town was the first in Jamaica to be electrified

Black River fell into a decline when synthetic dyes replaced logwood early in the 20th Century although it continued to be an active port Ships were loaded by lighter an activity that was still in operation up to the late 1960's when the port was closed to shipping Since then the growth of the town's economy has been outstripped by that of its rival, Santa Cruz located on the main south coast road which bypasses Black River

The town has changed relatively little over the past century and the slow pace of recent growth has left it with an essentially eighteenth-century street plan and some very fine examples of a wide range of architectural styles The structures lining the High Street create a place of great character and visual appeal These structures could be restored or rebuilt in keeping with predominant 18th and 19th century styles Other important structures include many vernacular buildings, the court house, hospital police station and church as well as warehouses and shops (For a 1988 JNHT description of 50 listed structures, see Annex D) However the draft EPF noted that "*Some of the buildings in Black River are severely degraded while others have been inappropriately renovated* Timely action is needed as recent building/development practice has altered the townscape " *Uncoordinated development without reference to old street plan or historic architectural styles has particularly impacted the High Street*

A serious effort is urgently needed to save the many buildings which are decaying and collapsing so that the architectural heritage of Black River can be protected In addition to the downtown structures and listed buildings other aspects of Black River's potential attraction include the mineral springs of the Black River Spa the water (Bay) front the Hendricks Wharf and the river front *All of these need attention and improvement*

The Black River Spa was once highly regarded for its healing properties It was a scenic pool fed by mineral springs According to a 1990 report the spa at Black River is a very attractive feature and plans have been made to develop an hotel in the area " *By 1998, the draft EPF noted Recently construction of new spa buildings was started They have been abandoned and the place is an eye-sore* The seawall walk is a special scenic feature There is nothing similar

elsewhere in Jamaica Some repairs were made in 1998 However further improvement is needed if the town is to capitalize on this unique feature *The narrow sidewalk on the seaward side is a deterrent* to any residents and visitors who wish to stroll along the waterfront and enjoy the view

Finally Taino remains near the Black River Hospital were destroyed during construction Other possible sites in the area will require identification and protection prior to future construction

Table 6-5 1 Architectural Heritage and Character (1990)

"The buildings in the town provide a wide cross section of Jamaica s architectural heritage and some excellent examples of civic design They are valuable resources worthy of protection

"At the eastern end of the High Street stands Hendrick's Warehouse dated 1913 This house is a fine illustration of a sturdy warehouse made of brick timber and iron and erected at the beginning of the century It has been well maintained and stands as a bold termination of the High Street complemented by the facade of the brick warehouse directly opposite

"The gently curving High Street has a fine selection of 19th Century shophouses with arcaded sidewalks below their overhanging first floors Besides a few poorly designed modern buildings which could be modified to better fit the context of the old town the buildings taken together create a very pleasing and well preserved historic urban element (see Photographs and Map section)

"To the western end of the shopping street the Parish Church forms a centrepiece of the square and is a focal point of the town The church is a typical example of edifices constructed in London stock bricks with first class workmanship The walls around the church yard have huge imported granite coping In his article 1974 the noted architectural historian T A L Concannon described the square as being one of the best pieces of civic design in Jamaica

"To the west of the square the High Street forms a sea side promenade Buildings are only located on the inland side of the road and are less densely spaced To the Western end are several larger merchants houses with names such as Magdala Invercauld and Waterloo

"Black River is noted for the quality and quantity of its detailing and its fretwork in particular - the most detailing being used on many of the smaller buildings

'Writing in 1816 (before many of the larger buildings were constructed) Monk Lewis said of this area The light coloured houses with their lattices and piazzas completely embowered by trees, altogether made the scenery of the bay wear a very picturesque appearance and to complete the charm the sudden sound of the drum and banjo called our attention to a procession of the John Canoe which was proceeding the opening of the New Year in the town of Black River '"

(From Study for the Plan for a System of Protected Areas Conrad Douglas & Associates 1990)

6-5 2 2 The Character of the Town Today

Current Functions and Economy Black River now provides government, market, financial and other services to western and southern St Elizabeth and is the seat of local government Port functions are very limited although the fishing port is the only place on the south coast (apart from Kingston) that can accommodate large fishing vessels In addition to fishing and other activities related to the natural resources of the morass, uses in the area include arable and cattle farming Industrial uses in and around Black River include glass making from silica sand (at Hodges) and tile making from clay Four Black River tour companies operate from the river banks near the mouth of the river but have little relationship with the town and reportedly little financial impact on it Most tourists are bussed in and out without having any opportunity to visit the town Fishermen some from as far as Treasure Beach also take tourists up the rivers in their canoes Despite the belated conduct of a carrying capacity study the nature and *intensity of the commercial tours conflicts with the lower intensity canoe tours and the potential to offer a wider range of tourist experience Fishermen who operate tours are not properly licensed, equipped or trained while commercial tour guides are not always adequately trained*

There are several small hotels and guest houses in Black River the largest of which is the excellently restored Invercauld Hotel Smaller hotels include Hotel Pontio Bridge House Hotel Waterloo Guest House, and, along the Crane Road, Irie Sands and Port of Call Some of the newer hotels suffer to varying degrees from the lack of intimacy that comes with over-use of concrete There are also several private beach houses along the Crane Road to Parottee strip

Infrastructure and Management Needs The Survey of Environmental Awareness conducted throughout the parish in late 1996[1], indicated considerable dissatisfaction with the state of the local environment The following list of concerns applies principally to the town, although some items apply to the wider river and morass environment

- Environment not clean and sanitary
- The state of the market
- The state of the fish vending area
- The absence of public conveniences at the market
- Old derelict buildings
- The hospital
- Congestion
- The broken seawall (since in part repaired)
- Waste being thrown in the sea
- Dumping of dead animals in the morass
- Stray animals on the road

Black River has suffered from *inattention to its infrastructure* and urgently needs improvements to be made to the Black River bridge (now apparently a focus of Ministry of Transport and Works) the Black River Hospital, the Police Station and other public facilities The town also *needs sewer and sewage treatment system(s) public sanitary facilities, and a more appropriate approach to solid waste* The citizens would like to have a central sewage plant constructed as soon as possible Many of these concerns continue to be heard in the media and have led in some cases to public protests and demonstrations

Pollution And Sanitation People complain that the beaches are contaminated by dunder residues and sewage Coastal pollution generated by the discharge of untreated sewage from Black River including sewage from the hospital and police station into the bay joins the plume of the Black River which often stretches several km offshore (larger in times of flood) The main currents along south coast combined with winds, mean that effects are most likely to be felt along the Parottee coastline and westwards towards Font Hill

The Black River dump is in the wetlands Illegal dumping of household garbage is a major problem around the town especially along Crane Road Every small track that enters mangroves from the road has been used as a dump site - spoiling visual quality of the

[1] Report on the Environmental Awareness Survey of the Black River Area Market Research Services Limited for TSS Inc July 1997 (conducted under the USAID-funded NRCA-DEMO Project)

area and potentially causing health problems The reasons for this should be determined and addressed and an effort made to clean up the area

Within the town there are problems with hygiene in the market and fish vending areas litter in the streets and old cars and machinery in defacing back streets Another form of pollution that can be a significant deterrent to visitors is noise Like many town Black River has its share of noisy bars and clubs

Visual Quality While the main street of Black River retains a certain visual integrity despite the intrusion of new concrete structures and the construction of concrete facades on many old ones the back streets of the town are developing in a very unattractive way with no sign of planning or any attempt to maintain the visual character of the town The old market is dilapidated and unhygenic and subject to flooding New two storey blocks of shops have been constructed apparently at random and the back streets are full of garbage There can be no incentive for tour operators to encourage visitors to spend more time in Black River while such ugliness and filth prevail More thought needs to be given to developing amenities in the town which will encourage people to linger there and spend money

Land Use Planning and the Expansion of the Town The nature and scale of urban development and expansion may influence the quality and stability of both the town and the wider ecosystem The informal debate about the appropriate direction of Black River s growth continues to be of particular concern Vacant land exists within the town that deserves to be efficiently and sensitively filled in berore expansion occurs

An extensive area of the Lower Morass on the northern edge of the town was filled in the early 1990 s without the benefit of an environmental impact assessment Further development on the east (morass) side would be incompatible with the objectives of a Black River Morass Protected Area and should not be allowed *Development along the Crane Road shoreline has resulted in loss of fringing mangroves visual access to the sea and public access to the beach* An effort is needed to consolidate development rights to remaining open parcels so that their visual recreational and environmental values can benefit the entire community

Pastures and guango savanna to the northwest are being consumed by subdivisions and the guango trees once an attractive signature feature of this area have mostly been felled Development to the north and west needs to avoid strip development and to pay attention to the maintenance or creation of attractive gateways to the town

Sensitive infill of Black River can play a major role in containing the pattern of growth in the proposed Protected Area from Font Hill to Parottee area preventing sprawl and improving the appearance of road and river gateways

6-5 3 Vision

The vision described in the draft EPF includes the following 'main street restored to its 19th (or 18th) century appearance craft and interpretation centers museum restaurants and other attractions " To this can be added a range of pleasant places to stay and to wander around a place that Black River residents are proud of and can profit from and a base for enjoying the entire downtown the beach the waterfront, the riverfront the morass and the western countryside

Designation of the entire town as a heritage or conservation area has often been proposed (by the UDC in 1991 by JCDT in 1992 and by the JNHT in 1997) The JNHT has recently announced (February 1999) the imminent designation of the town centre as a National Heritage Site The report on the JNHT announcement in Table 6-5 2 explains the agency s intent and the implications and benefits of the proposed designation for property owners

The parish Environmental Attitudes survey previously referred to found that St Elizabeth residents expressed the view that the town despite being naturally beautiful is somewhat underdeveloped and slow-paced Some respondents to the survey described it as a ghost town It is interesting that this view was voice principally by residents

[of the Santa Cruz area] ' which while it has become the economic center of the parish has grown at the expense of historical and cultural charm However it is a view held by many people in Black River that the town needs to grow and become modernized Old structures are expensive to maintain and may seem dated and inconvenient so old buildings are rapidly being replaced or their special features concealed behind modern shop fronts

During the delay in formal recognition the residents have risked foregoing the opportunity to develop an important heritage tourism site Clearly a major change in prevailing attitudes and carefully-planned action will be required to realize the town's potential It is hoped that the designation will help to change minds about the value of old structures and bring a recognition that the slow pace of change can have its reward in the form of tourism-generated incomes

Table 6-5 2 Proposed National Heritage Site Designation

Black River town centre designated National Heritage site

"Black River in St Elizabeth, one of the earliest commercial centres in colonial Jamaica, is to be declared a national heritage site

"In a letter to owners of buildings in the town, the Jamaica National Heritage Trust has told them that they are entitled to appropriate compensation for any financial loss, resulting from the designation, and to have treated as a deductible expense for income tax purposes, any amount of money spent on Work certified by the Trust as being necessary for the preservation of such land, buildings or property within the protected area

"Under the Jamaica National Heritage Trust Act, the owner of land and building so designated, will be barred from carrying out any demolition, removal or alternation, without the prior approval of the Heritage Trust, while the Trust may assist in the maintenance of such entities to prevent their falling into a state of disrepair

'According to the letter, the designated protected area includes all land and building on High Street, Crane Road Central Road and all the other roads which lead to the town centre This designation would therefore encompass the Invercauld hotel Magdala House, Black River Court House Catholic Church, the Anglican Parish Church Scotia Bank revenue office and the buildings which house the Jamaica Tourist Board and Black River Safari

The Trust has invited anyone who has any objection to the proposed designation to submit a letter outlining their reasons or alternatively to attend their office at 79 Duke St within 28 days of the date of the letter The Trust has warned that criminal proceedings may be instituted against land-owners who defy the Heritage Trust Act

"Maureen Edwards Theoc director of Heritage Protection Research and Information at the Trust said Black River had been chosen a national heritage site because of its unique and significant architecture She noted that Spanish Town Falmouth and Port Royal had already been declared protected sites ' Lincoln Ward The Daily Observer February 25 1999

6-5 3 Stakeholders

The main stakeholders in the Town of Black River include in addition to local residents the following

Local Residents
Downtown Merchants
Downtown Property Owners
Tour Operators
Hotel and Villa Owners
Port interests
Market Vendors
St Elizabeth Parish Council
Chamber of Commerce
Southern Parks and Markets
JNHT
NWC
JPSCo
ECD
JTB
TPDCo
Ministry of Transport & Works
Fisheries Division
NRCA

6-5 4 Strategy/Approach

The first steps in the recommended strategy are to use a combination of educational participatory and incentive techniques to appeal to as broad a cross-section of the town s stakeholders as possible to encourage residents to value (and benefit from) the historical structures and other assets of Black River

In addition to the incentives offered under the JNHT Act pioneers are needed to demonstrate to other landowners business people and residents of Black River the value of the town's layout and historic structures Private sector sponsorship of the restoration of a High Street structure should be to serve as a model for others to emulate

Strict controls are an important part of protecting the architectural and archaeological heritage However education guidance technical - assistance and financial incentives through a development on the lines of the [Kingston Restoration Company] KRC might ensure a far higher degree acceptance and compliance

Following rescue of the endangered buildings the strategy might seek ideas for recapturing the unique highly ornate neo-Georgian vernacular of the town that was the local version of architectural trends of the time and the "light coloured houses with lattices and piazzas embowered by trees' described by Monk Lewis

6-5 5 Proposed Management Sub-programmes

6-5 5 1 Protection and Conservation (Architectural)

1 Establish a Committee to assist the Parish Council the NRCA the proposed/delegated LME and the JNHT with refining the Action Plan deciding on priority actions and responsibilities

2 Identify Critical Needs and Opportunities

- 2 1 Solicit volunteer assistance from architects and planners including UTECH students
- 2 2 Encourage local residents to participate with JNHT in updating the architectural survey
- 2 3 Make a photographic record of every building and a montage of the elevations
- 2 4 Take photographs of the rears of buildings where visible
- 2 5 Find photographs or the former state of the buildings front elevations and rear/side elevations
- 2 6 Set up an exhibition in an easily accessible location with sidewalk advertisements to invite residents and visitors to see and comment on the montage of before and after shots

3 Hold a Vision Day to garner ideas from everyone about what s needed downtown Invite individuals locally and elsewhere who have restores and adapted historic buildings

- 3 1 Invite the JNHT to explain the benefits of and incentives for restoration
- 3 2 Invite individuals locally and elsewhere who have restores

and adapted historic buildings

3 3 Solicit the assistance of one or more companies or corporations such as paint and building materials companies that could subsidize improvement of one or more buildings and benefit through use of the story in their advertising

4 Consider a concert (Reggae, Gospel or other) at Hendricks Wharf to benefit (wholly of partially) the Downtown Renaissance effort

5 Hold a planning day on the improvement of the park other public open spaces street tree planting, etc

5 1 The presentation orders should be placed on the trees outside the courthouse and an effort should be made to halt to the felling and unprofessional pruning of trees by the Jamaica Public Service Company limited (JPSCo)

5 2 In order to protect the aesthetic quality of the streets, Development Control Policies need to be established to rectify the unsightly routing of utility lines and to control the indiscriminate use of advertising hoardings and signs

6 Hold a planning weekend on other planning needs, including the direction of growth of Black River, approaches to infill development, development standards etc

6 1 Request early start on preparation of the new Black River/St Elizabeth Development Plan and Development Order and ensure wide ranging local participation from the inception

6 2 Request early or interim modification of the Development Order for the Black River area to provide the Parish Council with the legal basis for guidance and protection

6 3 Lobby for initiation of studies of sewer and sewage treatment options (acknowledging that traditional central facilities are high in construction and operating costs and produce a lower quality effluent than is desirable in the Black River estuary and bay Small systems that make use of the morass to achieve tertiary treatment are likely to be lower in cost and more reliable as well as environmentally desirable

6 4 Lobby for a site selection study for new environmentally appropriate solid waste landfill sites

7 Affected agencies including the Town Planning Department, the Ministry of Local Government and Works, NRCA, JNHT and TPDCo perhaps with the assistance of UTECH, could arrange a seminar for the Parish Council and Black River businesses, residents and friends to explore the assets and needs of the town Such a seminar could provide information about the opportunities inherent in rehabilitation of the town and careful attention to its urban form and facilitate formulation of a concept and action plan by participants

8 Work towards establishment of an organization comparable to the Kingston Restoration Company to provide education guidance technical assistance and financial incentives and ensure a high degree acceptance and compliance with strict controls as part of an overall strategy to protect the architectural and archaeological heritage

6-5 5 2 Education, Promotion and Interpretation

As indicated above there is a clear opportunity to introduce the town's history and architectural heritage into local school curricula In addition there is an urgent need for public education to raise every citizen s knowledge of the importance of the heritage

Since most long-distance travellers by-pass the town of Black River via the secondary road from Luana to Crawford route, Black River has both a challenge and an opportunity The town will need to make a major effort to promote the attractions of a side trip or detour to both Jamaicans and international travellers However the economic benefits that can accompany conservation restoration cleanup imaginative improvements and being recognized as a truly special and exciting place may only be feasible as a result of being off the main route

The idea of a morass and coastal resource interpretive center is proposed in Chapter 6-2 A longer-term project could be the

development of a permanent local history and architectural interpretive exhibit in a downtown location

6-5 5 3 Recreation and Tourism

In addition to the architectural conservation program described above Black River will need to develop an array of other activities to gain the recognition and patronage it needs

Fairs, Festivals and Entertainment The historic records indicated that the Jon Conoe dance and festival was a major part of the Black River Christmas festivities and a tradition that could be revived Hendricks Wharf has been used as a performance space and should be reevaluated to determine its potential and improvement needs Local specialties (peg bread tiles fish) can be featured in promotions

Black River Spa A special effort is needed to restore or recreate the former beauty of this spot and at the same time provide the kind of attractive modern facilities that tourists now expect at spas

Sport Fishing The rivers of the Black River system have long been used by sport fishermen with snook tarpon snapper and mullet being favoured species There is anecdotal evidence that some sport fishing continues to a limited extent The resources would need to be evaluated before a decision could be taken about whether there is scope for encouraging sport fishing in the proposed protected area If the potential does indeed exist this activity alone could be what is needed to lift the image and the profitability of the town

Campsites and Trails Although the qualities of the Black River have been compared favorably with those of the Everglades National Park (Haynes 1984, Wade 1984) no campsites hiking or biking trails or birdwatching blinds are presently available in the area However in concert with other Protected Area programmes the town of Black River could be promoted as the base for other types of experience in addition to the well-known river tours

6-5 5 4 Protection and Conservation (Natural Resources)

Coastal and marine fishery species are highly dependent on the special ecological conditions provided by estuaries for feeding habitat and nurture of their young (Salm and Clark 1984) They may be divided into large species which visit the estuaries to feed and breed and smaller resident species which often fall prey to the larger species

Focus attention on infrastructure improvements necessary to protect health and the quality of the morass and the water off the river and bay

6-5 5 5 Legal Framework and Enforcement

Under the National Heritage Site designation owners of designated land and buildings will be barred from carrying out any demolition removal or alternation without the prior approval of the JNHT

Building standards and design review will be required to protect the context of the heritage structures

The principal needs are for a new Development Plan and Development Order that rationalizes land within the designated area and halts the sprawling developments in the pasture and swamp lands adjacent to the town

Tree preservation orders are needed in town and its surroundings

In all cases interim or emergency protection measures and regulations may be necessary because of the time typically entailed in developing new plans standards and regulations In addition, monitoring and enforcement will be required in all cases and will be more effective with an alert citizenry

6-5 5 6 Boundaries and Zoning

Boundaries and zoning will be based on recommendations developed through the Planning Day weekend and workshops

6-5 6 Action Plan

Table 6-5 3 Priority Issues and Suggested Actions

Issue	Actions	Stakeholders	Suggested Lead Agency/organ

6-6 TREASURE BEACH AND LOVERS' LEAP SUBAREA PLAN

6-6 1 Introduction

This proposed subarea includes the coastline from Starvegut Bay to Little Pedro Bay and the island shelf south to the 200 m benthic contour This includes the rapidly-growing resort villages of Treasure Beach and Great Bay and the famous beauty spot at Lovers Leap

The dry climate and unusual geological formations contribute to a unique landscape in this part of Jamaica The coastline is rocky with cliffs and small bays, or sandy with dunes Sandy beaches are used by nesting Hawksbill turtles Offshore there are reefs and sea grass beds that support a small population of manatees Behind the shore there are many small ponds of outstanding importance for wildlife, specially birds and pond turtles The limestone hills and headlands support interesting remnants of dry limestone forest

The land is mainly privately owned (except for the Forest Reserve at Yardley Chase/Lovers Leap) Tourism is starting to compete with fishing as the major contributor to the local economy The clientele is largely seeking alternatives to north coast tourism, and there is a growing demand for outdoor recreational activities However rapid expansion is threatening the resource base of the area

6-6 2 Objectives for the Area

The main objective for the subarea is continued sustainable improvement in the standard of living and quality of life of the people of Treasure Beach through integration of tourism development and conservation of the natural and cultural environment

6-6 3 Existing Conditions

6 3 1 Natural Resources

Terrestrial, freshwater and brackish ecosystems The plains surrounding Treasure Beach are characterized by attractive Lignum Vitae and Seymour Grass savanna *an artefact of hundreds of years of selective clearance and grazing* Beside the sea the beaches and cliffs are protected by coastal woodlands (with Sea Grape, Cashaw and endemic cacti) *The woodlands are being degraded by pirate harvesters who come in by boat to cut out trees for construction and pot sticks* The dry limestone woodlands of Great Pedro Bluff and the hills of Back Seaside, Lovers Leap and Roys Run are of great scenic value

Great Pedro Pond is a hyper saline lagoon, whose shallow productive waters provide habitats for shorebirds (see below) The stability of water-levels in Pedro Pond has been reduced because of over-grazing and soil erosion in surrounding subdivision as a result of badly designed roads and bulldozing of vegetation *In times of drought the pond becomes a dust bowl* A study of the pond needed to see whether water levels could be maintained without disrupting its ecology

Marine ecosystems Along the coast there are reefs and sea grass beds The coastline includes extensive white and grey sand beaches punctuated with rocky cliffs and coves Behind the beaches there are large sand dunes in some places which are of great importance in maintaining beach stability There are very interesting fossils, including fossil reefs and aeolian fossil roots

Animals Sea turtles nest along the coast in the small bays but *they are often taken by fishermen and their eggs illegally harvested* Manatees are often seen in Great Bay and are apparently protected by local fishermen

More species of shorebirds and ducks have been recorded from Great Pedro Pond than from any other site in Jamaica The many smaller ponds in the area are mostly fresh or brackish They support interesting plants and animals including the Jamaican Lotus, Jamaican Slider (an endemic pond turtle) native ducks and crakes The hills including Roys Run are much favoured by columbid hunters but land owners have proposed forming an association to limit hunting on their lands

Plants The area has not been well-studied but there is at least local one local endemic plant (*Verbesina propinqua* a type of daisy) which is known only from Lover s Leap *Sadly the last plants may have been lost as result of bulldozing of spoil during construction of the new restaurant* Several species of endemic cacti flourish in the area contributing to the characteristic landscape They are also subject to *illegal harvest for landscaping* and propagation is urgently needed Thatch trees are fairly common but there is little harvest of leaves for craft or roofs

Linkages The outstanding natural beauty and relatively high quality environment of the area is of great importance to the tourism product

Sites of special importance The ponds around Treasure Beach, specially Great Pedro Pond are of outstanding importance for wildlife and plants (see above) Some beaches are important for sea turtle nesting The coastal hills east of Great Bay are relatively undisturbed and require special recognition

Water Resources Saline intrusion has affected coastal wells

Mineral Resources Some of the sand dunes (near Fort Charles and Great Bay) have been legally or illegally mined and expansion may be under consideration

6-6 3 2 Cultural and Economic Resources

In the Pre-Columbian period there were large Taino settlements around the ponds and their locations are marked by middens rich in artefacts *Some areas have been destroyed before they have been documented* The area was occupied by the Spanish and by English settlers in the C17th Few relics of this period remain but the area developed a characteristic architectural style and *many outstanding examples of the vernacular architecture remain although they are rapidly being replaced by modern concrete structures*

Natural resources such as cashaw posts for fences are still harvested but the thatch and Lignum Vitae are little used

6-6 3 3 Recreation and Tourism

The landscape of this area is outstandingly beautiful unique in Jamaica and worthy of special conservation measures There is a need for a local planning scheme incentives awards competitions and education to maintain visual character of area

The history of tourism in the area goes back more than 50 years but until five years ago there were only a few beach villas and a small hotel Since then there has been rapid expansion of villas shopping plazas and restaurants *There is little employment for women whose main option is domestic work in hotels and villas* So far most developments have been small-scale and the only large hotel is the Treasure Beach Hotel which has 70 rooms *Development of a large hotel could upset the social and ecological balance of the area*

Fort Charles-Billy's Bay The new road has led to a rapid increase in construction along this stretch of coastline Assessment of Fort Charles Beach is needed to determine its carrying capacity and the most appropriate level of use

Treasure Beach and Great Bay *The rapid expansion of tourism and commerce in absence of planning threatens environmental, visual and social qualities of area* One exception is Jake's where the local architecture has been imaginatively adapted to create a very successful small hotel

Other issues affecting tourism are typical of a fishing beach in transition to a resort which is growing out of control They include *squatting on the foreshore (which NRCA is reluctant to control) specially by illegal bar operators and drug sellers increasing tourist harassment (mostly by outsiders) proliferation of bars with excessively loud sound systems and increasing crime and drug addiction*

Despite the dependency of the tourism product on beaches there has been no attempt to plan or zone beach use and tourism and fishing share the same beaches There are no public toilets and change rooms on Frenchman s Beach *Carrying capacity studies of*

beaches are needed This should be followed by implementation of planning controls designed to limit development to appropriate levels

Lovers' Leap This scenic site has not been developed to its full potential Construction of a surveillance site adjacent to the attraction and buildings along the top of the cliff are damaging the environment and detracting from the scenic value of the area *The building on the site is inappropriate and there is little to keep a visitor at the spot for more than a few minutes*

Public Bathing and Hotel Beaches There are public bathing beaches at Great Bay Calabash Bay Billy's Bay and Fort Charles and an hotel beach on Frenchman s Beach by Treasure Beach Hotel

Table 6-6.1 Stakeholders in Treasure Beach and Lover's Leap and Environs

Local residents

Bird watchers
Business people (shop owners restauranteurs hoteliers)
Householders
Hunters
Property owners and managers
Small farmers
Sport fishermen
Subsistence fishermen
Wage earners
Unemployed people
Villa owners

NGOs and community-based organizations

Treasure Beach Community Council
BREDS

Private businesses and companies

Island Outposts

Government Agencies

Resource use - specific
JTB
TPDCo
PCJ

Resource use - general
RADA
Fisheries Division
Division of Mines and Quarries
Pesticides Control Authority
ODP

Development planning
Commissioner of Lands
NRCA
PWD
St Elizabeth Parish Council
TCPA
South Coast Resort Board

Water supply and pollution control
ECD
Ministries of Water Agriculture, Tourism
N C
National Irrigation Commission
Southern Parks and Markets
WRA

Links to Other Areas Tourists staying in Treasure Beach use attractions throughout the parish specially boat tours on Black River and the YS Falls Many fishermen earn extra income by carrying tourists along the coast and up the Black River *They are not licensed and do not have life jackets on board Like other operators on the river they lack training in how to behave on the river to minimize damage to the river* Tourists in Treasure Beach support agriculture in the hinterland by buying local fruits and vegetables

The beaches in Treasure Beach serve communities and tourists from as far away as Mandeville and many people go there for day trips

6-6 3 4 Other Human Activities

Fishing Traditionally the economy of the area has been based on fishing mostly on the near shore and offshore There is some inshore fishing by young men with fish guns and fish pots but most fishermen travel to the banks A few fishermen take visitors fishing or on tours to Black River *No data are available about the status of in shore fishing grounds or nursery areas in need of protection* The Fishing Beaches at Great Bay Calabash Bay Frenchman s Bay Billy s Bay and Fort Charles support more than 3000 fishermen

Agriculture The dry climate and poor soils restrict agriculture to grazing (traditionally including goats sheep and cattle) although there is some potential for tree crops and forestry *The livestock industry is currently in crisis and land owners are seeking alternatives* The soils in the hills are mostly Class IVc (marginally suitable for agriculture but suitable for tree crops) and the plains are IV (marginally suitable for agriculture but suitable for tree crops or pasture) *The coastal aquifers are affected by saline intrusion* and over the last 40 years most old wells have become too salty to use for drinking or *irrigation The availability of water is a limiting factor*

Other As mentioned above timber fence posts, cacti and thatch are harvested from the woodlands Doves and pigeons (mostly White-winged and Mourning Doves) are hunted mainly in the season

Settlements and Infrastructure The main settlements are at Treasure Beach Billy s Bay and around Lovers Leap Connections to Black River have been greatly improved by a new road which (followed by electrification) has rapidly accelerated tourism development *This road is mostly single track and buildings are being constructed too close to it to allow for expansion specially in Billy s Bay* This needs urgent attention Water supplies have improved greatly over the last five years but there can still be *shortages in times of drought* mostly due to illegal abstraction of water for irrigation

The houses villas and small hotels of the area depend on cess pits and septic tanks for sewage disposal and *leakage into the sea is probably a problem although this has never been assessed* The *Old Wharf Resort/Tranquility Bay disposes of raw sewage via a pipe onto the reef and it is rumoured that other hotels are planning similar action* Tranquility Bay is up-current of Treasure Beach BREDS is proposing to begin water quality monitoring

This area is cleaner and tidier than most parts of Jamaica but increasingly *garbage is being dumped on the edges of Pedro Pond and roadsides* Visual pollution is not a major problem but there are increasing numbers of roadside signs and a few *untidy shacks and stalls are starting to appear on the road reservations* Most houses are clean and well maintained

Housing, Transportation and Community Services The development of tourism has increased land prices and contributed to *a shortage of affordable housing* Around Treasure Beach and Great Bay land is generally held by small holders Large blocks belong to Gilpin and James families The GOJ owns Lover's Leap Forest Reserve Development issues include an *old approved subdivision on an inappropriate site at Great Pedro Pond The Parish Council lacks the resources to enforce planning regulations effectively*

Transportation is mainly by minivan The nearest police station is at Pedro Cross There are schools at Sandy Bank and Southfield but high school students must travel to Munro Hampton or Black River

Commercial Activities Sand mining (see above)

Vulnerability to Disasters, Emergency and Disaster Preparedness *The low-lying areas are vulnerable to floods and liquefaction* including *parts of Fort Charles Pen Roys Run and Great Pedro Bluff* Starvegut Bay and Boatman s Bay *may be affected by storm surge* The coastal escarpment corresponds to a major fault line and is *vulnerable to earthquakes Great Bay is subject to beach erosion Pedro Pond forms a dust bowl when dry* Generally this simply results in a dust nuisance but it has been known to form dunes and block the main road *There are dangerous currents on several beaches including Frenchmen s Bay near Tranquility Bay, and Boatman s Bay*

Non-government Organisations The citizens' association (Treasure Beach Citizens Association) has been quite active and has helped to assist police to buy vehicles, address crime problems The frustrations experienced in citizens efforts to control illegal sound systems in the community have caused the community to loose confidence in its capacity to influence development Another lobby group is the Treasure Beach Tourism group, a new group that meets weekly to discuss issues related to tourism and community development A new organization BREDS is seeking to improve the community and to support youth programmes including sports Its funding initiatives include the Dollar a Day Programme, under which supporting guest houses and hotels pledge one dollar US for every night their accommodation is rented

Over the last five years immigration of strangers has led to a breakdown of traditional social order and an increase in drug abuse and crime

Incompatible Resource Uses *The main problems occur between low density resource-based tourism and other uses, including sand mining and bars and restaurants that feature loud music* The beaches are mostly long and have space to accommodate informal zoning of bathing and fishing activities without conflict but there could be problems in future if there is an increase in the number of fishing boats or tourists *More detailed consideration of zoning of beaches and provision of facilities is needed*

Sand mining has been authorized at Great Bay *Environmental impacts included noise and dust from trucks and equipment* on residential roads and in the tourist areas

Past and Present Conservation Attempts The importance of the area has been identified in many reports but there has been little action

Existing Legal and Management Framework There is a Forest Reserve at Yardley Chase

6-6 4 Management Strategies for Immediate Implementation

The future prosperity of this area depends on maintenance of a high quality social cultural and ecological environment The following actions will help the community to achieve this

6-6 4 1 Natural Resources

- **Consider declaring Great Pedro Pond as a Ramsar Site** Great Pedro Pond is one of the most important sites for migrant waterfowl and shorebirds in Jamaica and is deserving of international recognition
- **Seek funding for a REA** A REA is needed to assess the Biodiversity of the area and to determine conservation priorities Priority areas are likely to include Great Pedro Pond, Pedro Bluff Lovers Leap Fort Charles and the small sandy beaches to the west Species or groups of species of concern will probably include *Verbesina propinqua* Bullthatch, endemic cacti Lignum Vitae shorebirds waterfowl crocodiles and manatees Management plans for most of these species will be included in the overall management plan for the area but it may be necessary to refine some of the recommendations
- **Consider a restoration plan for Great Pedro Pond** The main objective will be to increase wildlife populations (and hence interest for visitors) and to prevent the pond drying up or otherwise becoming a nuisance In planning the future of Great

Pedro Pond it may be necessary to consider some habitat restoration specifically control of soil erosion in surrounding land and possibly some measures to remove some of the accumulated silt thus deepening parts of the pond and preventing it drying out Preventive measures may also be needed to prevent future degradation of the pond

- **Develop sea turtle conservation measures** Suggestions may be found in the sea turtle recovery action plan
- **Monitor key indicators of ecosystem health** A simple system of ecosystem monitoring should be considered Water quality monitoring will be of particular importance along the shoreline Monitoring of Great Pedro Pond should include monthly counts of birds and water levels Other aspects needing special attention will include monitoring of new construction sites to ensure that environmental regulations are observed
- **Carry out research** Research is not likely to be a priority at this stage in the project However should outside agencies wish to carry out research they should be facilitated and encouraged One focus should be the need for fish sanctuaries
- **Investigate the viability of a Botanic Garden or culture of natural resources** The possibility of developing commercial plantations of economically important species (including bull thatch cacti and Lignum Vitae could be considered)
- **Consider Tree Preservation Orders to protect trees of special scenic value** specially the old buttonwood to the extreme east of Frenchman s Bay and the old tree by the roadside bullthatch and baobabs at Treasure Beach Hotel
- **Reduce theft of lumber and sea turtle eggs from beaches** by public education and marine patrols

6-6 4 2 Cultural Resources

- **Conserve the landscape** The importance of the landscape should be recognized and steps should be taken to maintain it This will include regulations public education and incentives (see main report)
- **Preserve and enhance aspects of traditional lifestyles** including fishing basket-making traditional architecture
- **Increase revenue-cycling into community** via tourism new light industries new forms of agriculture and processing and crafts using indigenous materials
- **Document the Taino sites of the area** A project to do this (possibly using volunteers) should be developed Planning regulations should require inspection and excavation before construction and should provide for heavy penalties for wanton destruction of sites before inspection

6-6 4 3 Tourism and Recreation

- **Develop a Treasure Beach Vision Project** The Treasure Beach Tourism Council ecologist and a planner should work together to seek funding for a community project to develop a Tourism Master Plan for Treasure Beach and environs including a tourism vision for the area cooperative agreements with land owners to protect or manage for conservation sites of importance examination of sewage and garbage disposal road design and impacts mining proposals special planning controls incentives for appropriate development etc
- **Develop more nature and culture-based attractions** Specific proposals might include a bird watching hide on Great Pedro Pond walking and bicycling trails guided walks conservation/ recreational parks at Pedro Bluff and Lovers Leap Of course most of these suggestions involve private land and implementation would be subject to support from land owners Lovers Leap is a Forest Reserve and this should be respected
- **Plan development of beach facilities according to projected demand and carrying capacities** This will include zoning of beaches for fishing and bathing The possibility of zoning vending areas and banning itinerant vendors from beaches should be considered
- **Lobby for Treasure Beach to be declared a Resort Area** to provide greater control over development and activities such as vending
- **Encourage the Parish Council and NRCA to take stronger action against squatters, specially on the foreshore**
- **Encourage one operator to specialize in trips to Black River, to get properly equipped and licenced** Others should be discouraged

6-6 4 4 Settlement and Infrastructure

The LEA and the planning authorities should

- **instigate measures to redesign road rights of way,**
- **develop ways to deal with point sources of pollution**
- **install a tertiary treatment plant for sewage as soon as possible**
- **Ensure that new planning measures fully evaluate the impacts of potentially incompatible uses** such as tourism and mining or villas and clubs with loud music played outside in the same locality
- tighten planning controls
- Consider time limit for subdivision proposals and, in the interim, review of subdivision approvals which are more than 20 years old
- Assist parish council with monitoring and enforcement of planning regulations

6-6 4 5 Public Education, Public Relations and Interpretation

- **Ensure all projects have public education components**
- **Develop visitor centres and a visitors' guide to the natural history of Treasure Beach**
- Educate people about the value of local architectural styles and the possibility that they can be adapted for modern use
- Educate people about use of native plants in landscaping

6-6 4 6 Emergencies and Disaster Preparedness

- **Develop guidelines for construction and beach management to minimize effects of natural disasters** (including minimum setbacks from the sea, maintenance of natural vegetation cover on beaches)
- **Manage Great Pedro Pond to minimize the likelihood of its drying out** (see above)
- Provide training for fishermen and villa staff in how to rescue drowning people

6-6 4 7 Enforcement, Policies and Regulations

- **Develop new types of regulations for conservation on private land**

6-6 4 8 Administration

- **Determine a lead NGO** The first task will be to establish a local lead NGO which will begin project development and start to establish users' councils for fishers and tourism interests The existing *ad hoc* tourism council could take the lead for that sector

- **Work out administrative relationships with private land owners**

6-6 5 Boundaries and Zoning Plan

The following is a draft zoning plan to be used for discussion of the proposal

Table 6 6.2 Major zones proposed for Treasure Beach and Lovers' Leap		
Categories	**Suggested Areas**	**Notes**
Conservation Area	Whole MRPA	Special attention to be paid to development control and law enforcement
Wildlife Protection Area	Pedro Bluff and hills from Great Bay to Pedro Bluff selected beaches and other areas to be determined	
Restoration Area	Great Pedro Pond	
High density recreation area	Lovers Leap view point Selected beaches probably including Frenchmans Bay Calabash Bay and Great Bay	Studies needed to determine carrying capacities For beaches the need for change rooms toilets and ways in which fishing and bathing are zoned on these beaches should be assessed
Low density recreation area	Trail routes interpretive areas selected beaches (to be determined)	
Scenic routes	Main roads	Maintenance and improvement of visual quality will require public education and vigilance
Private Conservation Areas	Great Pedro Pond Pedro Bluff and coastal hills	These areas are of great ecological importance and are threatened

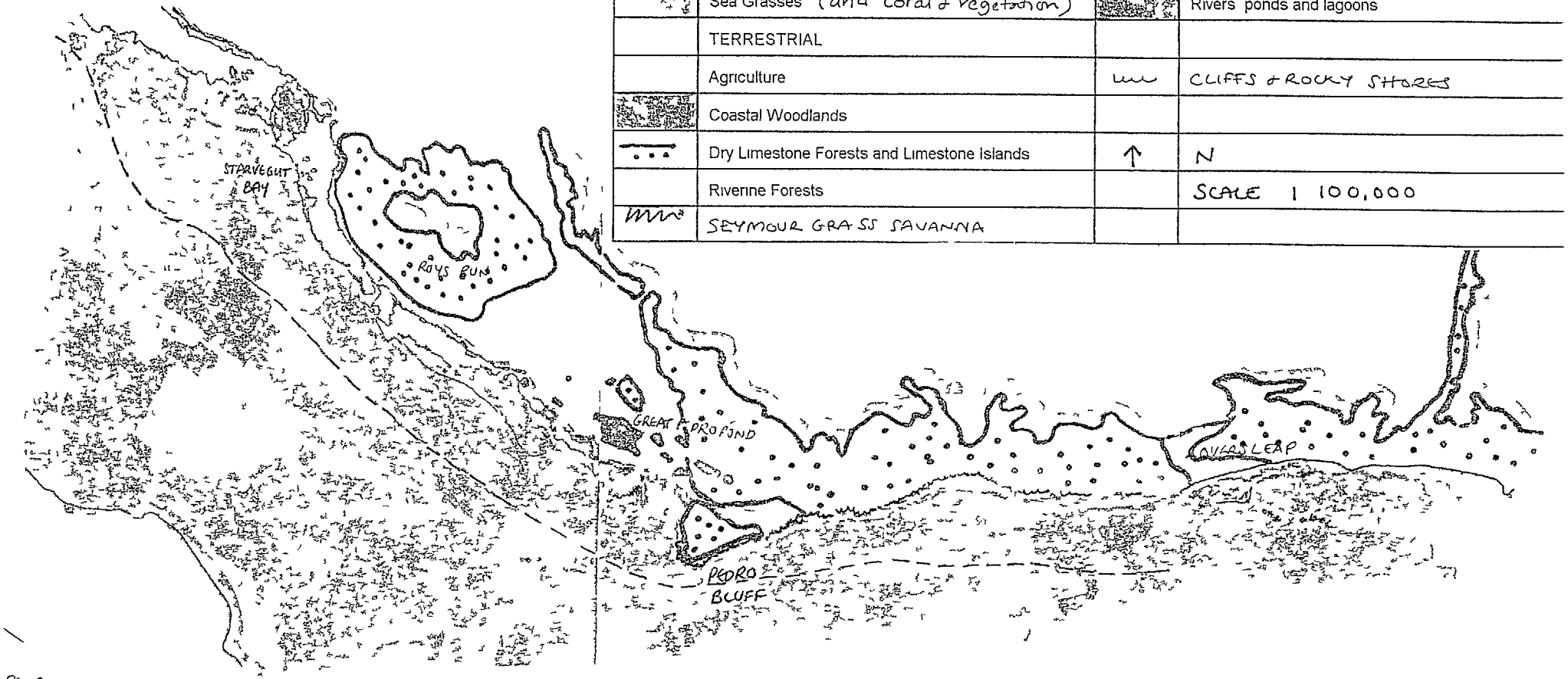
Table 6-6 3 Areas already protected or to be declared under existing laws			
Category	**Existing Areas**	**Proposed Areas**	**Notes**
Fish Sanctuary	None	To be determined	The need for fish sanctuaries in this subarea cannot be assessed on present data
Forest Reserve	Yardley Chase	None	No special management programmes are presently being implemented
Game Sanctuaries	None	None at present	
Tree Preservation Orders	None	Could include selected trees or groups of trees in Treasure Beach (see above)	Temporary measure to protect special trees
Protected National Heritage and Monument	None	To be determined	

Table 6-6.4 Major issues and some proposed actions (Priority actions are shown in bold)		
Issues	**Actions**	**Suggested Agency**
ECOSYSTEM AND SPECIES CONSERVATION AND RENEWABLE RESOURCES		
Lack of ecological data and current maps	- Seek funding for REA	NRCA NPPAW / LME
Pedro Ponds may be threatened and may require restoration	- **Start negotiations with owners** - If they are agreeable develop management plan to reduce impacts and identify need for restoration techniques - Assess need for conservation of small ponds - Consider Ramsar designation	NRCA NPPAW / LME / Land owners (James *et al*)
MONITORING		
No data on changes in natural resources	- **identify key indicators** (probably including sea turtle nests on selected beaches water quality number of birds on Great Pedro Pond)	NRCA NPPAW / BREDS / Volunteers
LEGISLATION REGULATIONS AND ENFORCEMENT		
No regulations or incentives for conservation on private land	**Develop appropriate regulations and incentives**	NRCA / LME
Important Taino sites are being destroyed	**Consider designation as Protected National Heritage** **Develop regulations to require assessment before development and penalties for wanton destruction**	LME / JNHT
Boat tours to Black River are dangerous	**Require licences**	TPDCo/NRCA / Parish Council
CULTURAL RESOURCES		
Degradation of architectural heritage	Consider need for incentives and education	LME/TPDCo / JNHT
TOURISM AND RECREATION		
Lack of unified vision of future development	Develop and implement Treasure Beach Vision Project	LME/South Coast Resort Board / Stakeholders

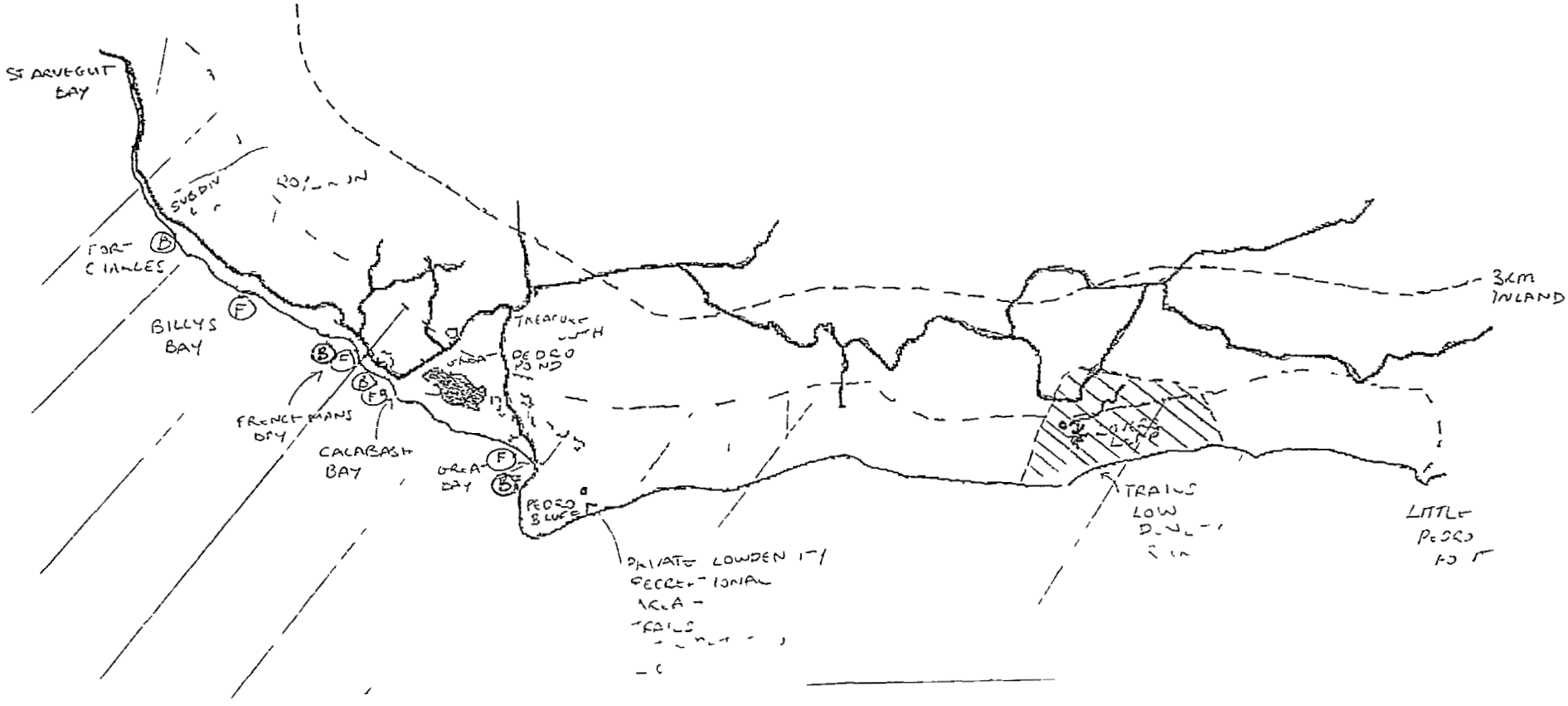
Carrying capacities of beaches reefs other resources not known	Commission studies as necessary	NRCA/TPDCo / LME / South Coast Resort Board/Developers
PUBLIC EDUCATION AWARENESS AND INTERPRETATION		
Lack of awareness and public support	***Public consultations re EPF and draft Management Plan*** Begin development of interpretive centre and trails (subject to ecological suitability)	NRCA / South Coast Resort Board / LME

TREASURE BEACH & LOVERS LEAP
MAJOR ECOSYSTEMS

KEY TO NATURAL HABITATS			
	MARINE		WETLANDS
	Coral Reef		Herbaceous Wetland
	Coral and Sand		Mangrove
	Sand		Swamp Forest
	Sea Grasses (and mixed coral & vegetation)		Rivers ponds and lagoons
	TERRESTRIAL		
	Agriculture		CLIFFS & ROCKY SHORES
	Coastal Woodlands		
	Dry Limestone Forests and Limestone Islands	↑	N
	Riverine Forests		SCALE 1 100,000
	SEYMOUR GRASS SAVANNA		



TREASURE BEACH AND LOVERS LEAP SDARCA DRAFT BOUNDARIES AND ZONING PLAN



KEY TO PROPOSED ZONES			
	Conservation Area		Low Density Area
	Wildlife Protection Area		Scenic Routes
	Restoration Area		Private Conservation Area
	High Density Recreation Area		FOREST RESERVE
			RESORT AREA

7 DRAFT ACTION PLANS FOR SELECTED SPECIES, ECOSYSTEMS AND RESOURCES

This section of the management provides preliminary outlines of action plans for selected species or groups of species (crocodiles manatees sea turtles and West Indian Whistling Ducks Water Hyacinth and Melaleuca) ecosystems (coral reefs sea grass beds rivers beaches mangroves and swamp forests) and resources (marine and freshwater fisheries)

The purpose of the section is to provide some background information about the main issues affecting threatened and economically important resources, and the types of action that may be required to address them

7 1 Species

Table 7.1: American Crocodile *Crocodylus acutus*

INTERNATIONAL STATUS	Endangered
DISTRIBUTION Global National Regional	 Southern US Central America and the Caribbean Mainly south coast and Falmouth Luana/Font Hill Black River Morasses Parottee Ponds
POPULATION Global National Local	 Declining Not determined probably declining **Font Hill** 1986-7 73 (including 7 breeding adults) 1990 probably less than 40 **Black River Lower Morass** More than 7 **Black River Upper Morass** No data **Parotee, Thatchfield and Treasure Beach** No data (occasionally seen in Great Pedro Pond)
LIFE HISTORY	
Feeding grounds	Sea rivers ponds and streams
Preferred food	Fish and dead animals
Nesting sites	Nests on sand soil or rubble bars near water Good nesting habitat is in short supply and is increasingly threatened by coastal development Some important areas (e g at Parottee) have already been lost
Nursery sites	Shallow ponds and small streams in concealed or undisturbed places
Resting and basking	Among dense vegetation on river banks berms or beaches
Migration routes	Patterns of movement are not known Animals are territorial Some animals move along coast daily (e g from Black River to Parottee) or seasonally in response to changing water levels and food availability (e g between Font Hill and Parottee)

LINKAGES	Keep fish populations healthy by culling diseased animals Assist with nutrient cycling thus increasing production of fish Tourism value lifetime value of one live crocodile on Black River estimated as US$3 7 million Meat skins and teeth of captive-bred animals are marketable
LEGAL STATUS	Totally protected under Wild Life Protection Act also protected under CITES and SPA Protocol
THREATS	
Natural	Flooding or destruction of nest sites after storms Drought makes ponds smaller animals concentrate and become more vulnerable
Man-related	Hunting (sport food fear specially Font Hill) Disturbance (e g on Black River boat tours operators like to make them move) *Destruction of nesting habitat for fishing and bathing beaches houses villas and hotels (specially Font Hill and Parottee)* Drainage of small ponds (decreases safe habitats for juveniles) Adverse perceptions Although crocodiles usually avoid people they are seen as a threat to humans and livestock and people traditionally take considerable risks to kill them whenever they see them Unfortunately commercial tour boat operators have started to feed crocodiles This increases the probability of incidents because they will lose their fear of man and will associate people and boats with food
Potential	Total elimination of nesting habitat unless stretches of suitable coastline are left untouched
SPECIFIC CONSERVATION NEEDS	Effective protection of good habitat specially nest areas Public education and better public relations! Ban on feeding by boat tour operators
PREVIOUS PROPOSALS AND ON-GOING CONSERVATION EFFORTS	- Font Hill has repeatedly been proposed as a Crocodile Reserve or crocodile farm Crocodile Working Group was encouraging surveys and developing national conservation strategy (but is not active at present)
SOCIO-ECONOMIC CONFLICTS	People are not willing to co-exist with crocodiles
PRIORITY LEVEL FOR ST ELIZABETH	Very high
SUGGESTED ACTIONS	**Research** Assessment of status of crocodile populations in St Elizabeth specially age structure of population and location and status of nesting areas **Habitat protection** Implementation of plans for reserve at Luana/Font Hill protection of key habitats in Black River Lower Morass and Parottee **Public education** local programme stressing value appropriate action when faced with crocodiles **Use** investigate feasibility of CAMPFIRE-type programme for relocation of nuisance animals **Marketing** develop souvenirs and T-shirts and ensure that royalties support crocodile conservation **National recovery strategy** Encourage revival of Working Group
SOURCES	Haynes-Sutton and Proctor 1992

Table 7 2 West Indian Manatee *Trichechus manatus*	
INTERNATIONAL STATUS	Endangered Protected under SPAW and CITES
DISTRIBUTION Global/regional Jamaica Local	 Larger Caribbean Islands and Florida to Guianas Mainly south coast Great Bay, Black River previously Font Hill
JA POPULATION	<50 once seen regularly off St Elizabeth coast now very rare (probably = or <3)
LIFE HISTORY	
Feeding grounds	Sea grass beds and rivers (including Font Hill, Black River Bay and Great Pedro Bay)
Preferred food	Sea grasses
Breeding Grounds	Previously mated (spectacularly) off Font Hill
Calving Grounds or nesting sites	Parturition occurs in inshore shallows (specific locations not known, but suitable sites exist in Black River area)
Nursery sites	No data calves stay with mothers for more than a year, mothers tend to stay close to shore
Resting and playing areas	Not known
Migration routes	Not known Males may patrol coast while females are more sedentary
LEGAL STATUS	Species totally protected No protected habitat
THREATS	
Natural	None known
Man-related	- Accidental and semi-accidental capture, often in beach seines near river mouths - Slaughter and sale as food - Meat and hide formerly highly prized - Disturbance of feeding and loafing grounds by boats - Possible reduction of extent and quality of feeding grounds as a result of coastal pollution
Potential	Injury by boat engine propellers is a problem in Florida It has not been reported in Jamaica

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SPECIFIC CONSERVATION NEEDS	Recent (1998) surveys and national management plan has been drafted Priorities include - Effective protection from hunting over sufficiently large area to ensure survival through protected areas law enforcement and public education Efforts should be focused on fishing beaches at Treasure Beach and Black River
SOCIO-ECONOMIC CONFLICTS	The capture of a manatee is regarded as a windfall that fishermen may be unwilling or financially unable to forgo
IMPORTANCE OF ST ELIZABETH	Manatees were once common in the sea and river but are now very rare They are still seen in small groups near Pedro Bluff This is probably the only place in Jamaica where manatees are still seen from the shore
SUGGESTED ACTIONS	**Legislation** No special legislation needed **Habitat protection** effective protection of Galleon Beach and Font Hill coastline might encourage animals to return assuming food sources are still present **Zoning** Important feeding areas should be identified and zoned as wildlife protection areas with limits on boat traffic **Education and awareness** General awareness in coastal areas Fishermen's awareness campaign (mainly Alligator Pond Great Bay Black River and Whitehouse) **Monitoring** - Involve fishermen and tourists to report **ad hoc** sightings - Maintain database of reported sightings - Aerial surveys at regular intervals would be of interest but would be expensive
SOURCES	Fairbairn and Haynes (1981) Manatee recovery plan (1998) NRCA Manatee Survey (1998)

Table 7 3 Sea Turtles HAWKSBILL TURTLE *Eretmochelys imbricata*, GREEN TURTLE *Chelonia mydas*, LEATHERBACK *Dermochelys coriacea*, LOGGERHEAD *Caretta caretta*	
INTERNATIONAL STATUS	Endangered
DISTRIBUTION National Regional Global	 Island wide Oceanic Pan-oceanic
POPULATION Global National	 Not known declining **Hawksbill** A few hundred nesting females Declining **Green** Once abundant Now probably less than 10 **Leatherback** Uncommon Now probably less than 5 **Loggerhead** Once common Now probably less than 5
LIFE HISTORY	
Feeding grounds	**Hawksbill** Coral reefs **Green** Sea grass beds **Leatherback** Open water **Loggerhead** Seabed
Preferred food	**Hawksbill** Sponges **Green** Sea grass **Leatherback** Jellyfish **Loggerhead** Molluscs and crabs
Breeding Grounds	Mate close to shore often on or near reefs
Calving Grounds or nesting sites	Nest on sandy beaches, with vegetation Billy's Bay, Malcolm Bay Crawford, Galleon and Font Hill are of national possibly regional importance
Nursery sites	Not well known includes sargassum rafts
Resting and playing areas	Not known
Migration routes	Not known On-going satellite tagging programme should provide useful information
LEGAL STATUS	Totally protected under WLPA CITES,SPAW

THREATS	
Natural	**Natural predators** Birds insects and fish prey on eggs and juveniles but adults have few natural enemies **Diseases** Fibropapiloma is a problem in Florida but has not been reported in wild turtles in Jamaican waters **Storms** destroy nesting habitats flood nests
Man-related	**Introduced predators** Dogs cats rats and mongoose take eggs and juveniles **Humans** People take eggs and adults as food and aphrodisiac collect shells (specially hawksbill) as craft material **Habitat destruction** Loss of beach nesting habitat to development degradation of feeding habitat by pollution
Potential	- Construction of villas and hotels on large and small beaches could result in further habitat loss - Compaction of sand by ORVs and foot traffic
CONSERVATION PROGRAMMES	- Sea Turtle Recovery Action Plan (STRAP) for Jamaica in preparation - Sea Turtle Network meets monthly implements education and monitoring projects
SPECIFIC CONSERVATION NEEDS	**Management planning** Completion and implementation of STRAP **Legislation/regulations** For selected Wildlife Protection Areas (e g Font Hill) **Enforcement** More beach patrols needed specially at Font Hill and Parottee to Fort Charles **Education** General awareness Implementation of "turtle friendly tourism" campaign (including specific guidelines to protect sea turtle nests on private and hotel beaches) **Habitat protection** Protection of important nesting beaches at Malcolm Bay and Font Hill **Predator control** Management of introduced predators on beaches in Wildlife Protection Areas **Research and monitoring** Monitoring of main nesting beaches daily during 6 week core season annually **Development control** Sea turtle nesting must be considered before planning approval granted for beach front properties Some areas may be zoned for no construction others construction may be allowed subject to guidelines
SOCIO-ECONOMIC CONFLICTS	Turtles are so rare that no fishermen specialize in them any more Most fishermen would welcome effective enforcement specially if turtles could be shown to generate revenue e g through turtle watches
NATIONAL PRIORITY LEVEL FOR ST ELIZABETH	High Nationally (possibly regionally) important nesting beaches
SUGGESTED ACTIONS	**Tourism** Examine feasibility of commercial turtle watches in Font Hill/Malcolm Bay area **Zoning and Wildlife Protection Areas** Protect Font Hill and if possible Malcolm Bay and Billy's Bay **Public education** Increase education and enforcement with special focus on parish council developers and property owners
SOURCES	Haynes-Sutton **et al** (in prep)

Table 7 4: West Indian Whistling Duck *Dendrocygna arborea*	
INTERNATIONAL STATUS	Vulnerable
DISTRIBUTION National Regional	 Northern Greater Antilles Coastal wetlands specially Black River morasses
POPULATION Global National	 Probably less than 8,000 Probably less than 500
LIFE HISTORY	
Feeding grounds	Herbaceous swamps with standing water
Preferred food	Plants and seeds
Nest sites	Grassy banks mangrove roots or holes in trees
Nursery sites	Herbaceous wetlands
Resting and playing areas	Reedbeds, mangroves clumps of trees in swamp
Migration routes	Daily movements between roosting and feeding grounds
LEGAL STATUS	Protected Wild Life Protection Act CITES SPAW
THREATS	
Natural	Drought, fire
Man-related	- Illegal hunting - Proposed open season for migratory ducks - Habitat disturbance and destruction (including expansion of cane cultivation fires spread of alien plants drainage of ponds and wetlands, grazing cattle in nesting areas, clearance of mangroves) - Introduced predators (mongoose cats)
Potential	Depletion of populations below minimum level

CONSERVATION ACTIONS	Survey of Black River on-going education programme on-going materials are available but much more work is needed including comprehensive management plan
SPECIFIC CONSERVATION NEEDS	Identification and effective protection of nesting feeding roosting and diurnal migration routes Development of watchable wildlife ponds and West Indian Whistling Duck Conservation Centre Adoption of West Indian Whistling Duck as flagship species for Black River MRPA
SOCIO-ECONOMIC CONFLICTS	Hunting in nesting feeding or roosting habitats
PRIORITY LEVEL FOR ST ELIZABETH	Very high Black River may be of global importance for this species
SUGGESTED ACTIONS	Further research to determine minimum habitat needs Protection of critical habitats in Black River particularly Upper Morass
SOURCES	Haynes-Sutton 1997, 1998a b

Table 7 5 Water Hyacinth *Eichhornia crassipes*	
INTERNATIONAL STATUS	Probably native of Brazil now widespread globally
DISTRIBUTION National Regional	 A pest in polluted, slow-flowing or stagnant water See above
ECOLOGY	Rapid dense growth blocks waterways and crowds out benthic vegetation Seeds remain viable in water for more than 10 years Reportedly eaten by manatees, but not a favourite food Small rafts function as fish and shrimp nurseries
LEGAL STATUS	Not protected
SPECIFIC CONSERVATION NEEDS	- Control measures include manual clearance of blocks in the rivers caused by water hyacinth A boat with macerating equipment was placed on the river in 1998 - The cut plants wash down-river and thence to local beaches where they form ugly and smelly piles - The plant flourishes in the Black River where wastes from Appleton and other sources have contributed to eutrophication
SOCIO-ECONOMIC CONFLICTS	Blockades caused by hyacinth impede fishermen and tour boats on the rivers
PRIORITY LEVEL FOR ST ELIZABETH	Very high
SUGGESTED ACTIONS	- Alternative uses (e g craft materials or fertilizer) should be sought for water hyacinth - Sources of pollutants should be regulated - The effectiveness of the new macerating equipment should be evaluated
SOURCES	

Table 7 6 Bottlebrush *Melaleuca* sp	
INTERNATIONAL STATUS	Locally abundant considered a serious threat to wetlands in Florida
DISTRIBUTION National Regional	 Not determined Established in several locations in the Upper Morass (where it is spreading) at least one (Middle Quarters River) in the Lower
PREFERRED HABITAT	Not determined seems to do well in herbaceous wetland
LEGAL STATUS	Not protected
THREATS	
Natural	None known
Man-related	None known
Potential	None known
SPECIFIC CONSERVATION NEEDS	This species apparently threatens the natural regeneration of the wetland and appears to be spreading Eradication should be considered However since the natural vegetation of the Upper Morass is missing it may be providing useful habitat to birds and other species
SOCIO-ECONOMIC CONFLICTS	None known
PRIORITY LEVEL FOR ST ELIZABETH	Moderate to high
SUGGESTED ACTIONS	Determine rate of spread of species Examine ecological functions (e g would eradication have adverse effects on threatened species such as West Indian Whistling Ducks that may roost or feed in it?
SOURCES	

7 2 **Ecosystems** (next page)

Table 7 7 Coral Reefs	
DISTRIBUTION Global Regional Local	Pan-tropical Mostly north coast Small patch reefs and small fringing reefs scattered along coastline Closest to shore at Scotts Cove
DESCRIPTION	No data
SIGNIFICANCE	All remaining reefs in Jamaican waters are of significance
OUTSTANDING EXAMPLES	No data
LEGAL STATUS AND POLICY	Some species of corals are protected
THREATS	
Natural	Long shore sediment transport e g from Rio Minho (quantity of silt increased by severe deforestation in upper watershed) Freshwater outflows from rivers and springs (volume increased by flash flooding as a result of deforestation and channelization of wetlands) Die-off of Black Sea Urchins (grazers) led to over-growth of algae
Man-related (see also following table)	Coastal construction - increases sediments Pollution (e g in Black River plume) Diseases (probably exacerbated by pollution and global warming) Bleaching of corals to create channels and beaches Removal of herbivorous fish (and spear fishing generally) Siltation (see above) Freshwater (see above) Dynamiting and poisoning of fish Damage by boats anchors
Potential	
SPECIFIC CONSERVATION NEEDS	- Improved fisheries management - Improved coastal planning
SOCIO-ECONOMIC CONFLICTS	
PRIORITY LEVEL FOR ST ELIZABETH	High
SUGGESTED ACTIONS	- Base-line survey to determine current status - Monitoring to determine changes in response to management - Implementation of area-specific management strategies and zoning
SOURCES	

Table 7 8 Coral Reefs - Examples of Impacts and Management Responses

CATEGORY OF IMPACTS	TYPES OF DAMAGE	SUGGESTED MANAGEMENT RESPONSES
COMMERCIAL AND RECREATIONAL ACTIVITIES		
Coastal construction (e g tourist facilities homes on beaches or wetlands near reefs coastal roads and trails)	Sediments enter sea and kill corals by smothering them or depriving them of light Increased freshwater run-off kills corals	- Require minimum set back from sea and retention of coastal vegetation - Require use of sediment traps during construction - Ban construction in coastal wetlands
Construction on reefs (e g navigational aids) and blasting of reefs to make beaches and	Mechanical damage to corals May change water flows thus changing ecology	- Require EIA - Ban blasting of reefs
Anchor damage	- Even small anchors break or damage corals	- Suggest alternatives (e g sand bags for small boats) - Determine need for compulsory mooring buoys
Diver damage	- Not a problem at present but all diving causes some damage	- Educate divers and operators - Monitor sites and consider periodic closure for recuperation
Small boat damage	- Grounding on reefs kills corals	- Consider system of marked channels and buoys in sensitive areas
Reef walking	- Popular viewing method specially where reefs are close to shore e g Treasure Beach causes physical damage and is risky to walkers (drownings at Treasure Beach)	- Reef walking should be carefully controlled - Reefs should be monitored and closed to walking if necessary
B FISHING AND COLLECTING		
Fish pots (Antillean Z Traps)	- Cause physical damage to reef and deplete fish populations specially of mesh size is small - If lost can become a long-term sink for fish	- Increase minimum mesh size (pot exchange programmes) - ban pots from selected areas
Spear Fishing	- Selective removal of large attractive fish - Conflicts with underwater photography and fish watching	- Ban spear fishing

Collection of aquarium fishes	- Can be damaging if chemicals are used to stun fish	- Zone areas for suitability - Require permits and monitor carefully
Dynamiting	- Permanently destroys reef	- Strict enforcement needed
Fishing with poisons	- Destroys reef and other organisms	- Strict enforcement needed
Collection of living corals	- Destroys reef	- Strict enforcment needed
Shell collection by tourists or commercial operations	- Collection of living materials can damage reefs	- Discourage shell collection but commercial use of disguarded conch shells should be considered
3 POLLUTION		
Herbicides	- May interfere with basic food chains - Even low concentrations can have serious effects	- Examine ways of limiting use of herbicides in watershed
Pesticides	- May selectively destroy zooplankton and corals specially larvae	- Examine ways of limiting use of pesticides in watershed
Sediments	- Smother substrate - Smother filter feeders - Reduce light penetration - May absorb and transport other pollutants	- Promote forestry and agroforestry in watershed - Require sediment controls for coastal construction
Sewage nutrients fertilizers and detergents	- May cause eutrophication and death of corals and other organisms	- Lobby for central sewage systems with tertiary treatments (specially Black River and Treasure Beach) - Improve sewage disposal for individual dwellings - Provide approved site for disposal of cess pit wastes
Gas and oil	- Can seriously damage reefs	- Develop oil spill contingency plan - Provide approved disposal sites for used oil - Prosecute people who dump oil in the sea or rivers
Antifouling paints and agents	- May kill some elements of reef ecosystem	- Exercise caution in allowing expansion of shipping traffic

Table 7 9 Rivers, streams, ditches and ponds	
DISTRIBUTION National Local	Black River is the longest river system in Jamaica Temporary or permanent bodies of fresh or brackish water occur throughout the region and range from small temporary hyper-saline ponds to the largest body of freshwater in the island
DESCRIPTION	Considerable variation in species composition and ecology depending on ecological conditions but little information is available
GENERAL SIGNIFICANCE	Aquatic plants act as indicators of water quality Rivers and streams form essential habitat for juvenile shrimp and fish Ponds in the morass serve as nurseries for juvenile crocodiles Ponds form essential habitat for West Indian Whistling Duck and Jamaican Slider (Pond Turtle) Ponds attract native and migratory waterfowl and shorebirds including rare and unusual species Parottee and Great Pedro Ponds are the best waterfowl ponds in Jamaica Rare plants include the night-blooming waterlily in Lower Morass and assemblages of rare plants in the Styx River
OUTSTANDING FEATURES	Lower Black and Broad Rivers (tourism value) YS Falls (tourism) Styx River (rare plants) Treasure Beach ponds (shorebird and pond turtles) Luana/Font Hill ponds (crocodiles) Slipe/Cataboo ponds (rare plants) Wallywash (largest freshwater body in Jamaica) Upper Morass (duck habitat) Black River mineral spring (reputed healing qualities)
LEGAL STATUS AND POLICY	There are few comparable areas in Jamaica and none is protected except for the canals of Negril Morass
THREATS	
Natural	Drought
Man-related	Increased boat tour traffic on Black River Pollution (specially Appleton but also agricultural and urban run-off and sewage) Road-widening if it impinges on roadside ponds Invasive species (specially Water Hyacinth) which out-compete native species
Potential	Without control boat tour traffic could increase (both numbers of trips and area disturbed)

SPECIFIC CONSERVATION NEEDS	Pollution survey Pollution control Up-to-date information on status of ecosystems Protection of small ponds Provision of information to developers and PWD Determination of management options
SOCIO-ECONOMIC CONFLICTS	Pressure to increase number of boat tours Pressure to expand towns and villages and fill ponds nearby
PRIORITY LEVEL FOR ST ELIZABETH	High
SUGGESTED ACTIONS	Base-line survey Area-specific management plans
SOURCES	

Table 7 10	**Sea grass beds** (mostly *Thalassia testudinum*), Sea grass with scattered coral heads, mixed corals and algae
DISTRIBUTION Global Regional Local	 Pan-tropical Mainly found on coastal shelf south of Jamaica Most extensive south and east of Treasure Beach where coastal shelf is widest
DESCRIPTION	No scientific studies have ever been conducted on these Sea grass beds
SIGNIFICANCE	Sea grass beds are highly productive and form nurseries for commercial varieties of fish They play an important role in stabilizing the coastline Concentrations of manatees and marine turtles in this area are probably associated with food resources in Sea grass beds
OUTSTANDING EXAMPLES	Font Hill Algal reefs off Treasure Beach
LEGAL STATUS AND POLICY	
THREATS	
Natural	The extent and quality of seagrass beds is subject to seasonal fluctuations
Man-related	Disturbance by beach seines and dynamite, removal to 'improve' beaches death due to excess sediment pollution coastal erosion
Potential	Increased human disturbance
SPECIFIC CONSERVATION NEEDS	To be determined
SOCIO-ECONOMIC CONFLICTS	- Hotel and recreational beaches clear sea grasses to improve" swimming areas
PRIORITY LEVEL FOR ST ELIZABETH	High
SUGGESTED ACTIONS	- Base-line survey to determine current status of all remaining beds - Monitoring to determine changes in response to management - Implementation of area-specific management strategies and zoning
SOURCES	

Table 7 11 Swamp (Marsh) Forests	
DISTRIBUTION National Regional	Restricted to St Elizabeth and Westmoreland One of the rarest and most threatened ecosystems in Jamaica No other examples in the West Indies Similar to Amazonian swamp forest
DESCRIPTION	"Superb 'jungle' type of forest dominated by *Symphonia globulifera*' (Boarwood), "*Terminalia latifolia*" (Broadleaf) "*Hibiscus elatus*' (Blue Mahoe) and the tall palm *Roystonea princeps*" (Royal Palm) "(endemic to Jamaica) " Dense understorey includes Anchovy Pear *Grias cauliflora* and many other plants Most accessible remnants have been heavily logged leaving little except *Roystonea*
SIGNIFICANCE	Important because of rarity beauty and genetically reserves of species of economic importance (Blue Mahoe)
LEGAL STATUS	Degraded patch of "Royal Palm Forest" protected in Negril Environmental Protected Area does not compare in size or importance with examples in Black River
THREATS	
Natural	Disease may be affecting Royal Palms
Man-related	Uncontrolled lumber extraction Clearance of centres of patches for illegal agriculture Grazing inhibits natural regeneration Fire inhibits natural regeneration Effects of opening channels to allow tour boats into centre of forest have not been determined
Potential	Effects of invasive species
SPECIFIC CONSERVATION NEEDS	Better information on current status Control of access Protection from fire
STAKE HOLDERS	Current users (farmers tour operators wood cutters, sawmill operators fishermen)
PRIORITY LEVEL FOR ST ELIZABETH	Very high
SUGGESTED ACTIONS	- Base-line survey to determine current status of all remaining patches in the upper and lower morasses - Monitoring to determine changes in response to management - Pilot rehabilitation project - Zoning and development of appropriate strategies for use of selected areas (if any)
SOURCES	Proctor (1983) Haynes-Sutton and Proctor (1992)

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Table 7 12 Mangroves Red Mangrove *Rhizophora mangle* White Mangrove *Lagunculana racemosa* Black Mangrove *Avicennia nitida* Buttonwood Mangrove *Conocarpus erectus*	
DISTRIBUTION Global Regional Local	Pantropical Found mainly along the south coast **Luana/Font Hill** extensive black mangroves red mangroves around ponds and along coast **Lower Morass** Formerly more extensive Small patches along Black and Broad Rivers and between Broad River and the sea **Parottee and Thatchfield** extensive Red Mangroves behind ponds remnant Black and Buttonwood to seaward **Treasure Beach** Occasional Buttonwood one or two patches of Red
DESCRIPTION	Red Mangroves are generally found in saline areas along rivers and sea coast In sheltered conditions can be more than 15 m tall (e g scenic mangrove corridor on Broad River) White mangroves are relatively rare and restricted to moderate to low salinities Black mangroves occur in intermediate conditions They tend to form large stands (e g at Luana/Font Hill)
SIGNIFICANCE	- Mangroves are of great ecological and economic importance because of their high productivity capacity to act as fish nurseries and to stablize shorelines and river banks preventing coastal erosion and saline intrusion Many commercial fish and rare species are directly or indirectly dependent on mangroves - Black mangrove honey is very high quality - With proper management mangroves can be a sustainable source of timber - Global warming is expected to result in the landward extension of mangroves Where they remain intact mangroves should help to protect coast from the effects of global warming
SPECIAL SITES	Luana/Font Hill (crocodile ponds and coastal protection) Malcolm Bay (well-preserved forest functions not assessed) Black and Broad Rivers (tourism) Crane Road-Parottee (coastal protection and wildlife habitat) Thatchfield (not assessed)
LEGAL STATUS AND POLICY	Small areas of mangroves are protected in the Montego Bay Marine Park and the Negril Environmental Protection Area The NRCA has developed a policy for Mangrove Management
THREATS	
Natural	Hurricane and storm damage could be exacerbated by global warming

Man-related	- Cutting for poles, posts and charcoal (reduces coastal protection wildlife habitat) - Changes in water regime as a result of drainage and water extraction and changes in water channels - Clearance for coastal development (increases coastal erosion reduces coastal protection destroys crocodile nesting habitat) - Fires (prevent regeneration) - Grazing (prevents regeneration) - Dumping of garbage in mangroves (prevents regeneration pollutes water unsightly, dangerous and destructive) - Hunting of columbids (reduces natural regeneration) - Fishing using nets in mangrove pools threatens crocodiles - Spraying with Malathion could have little understood effects
Potential	Extension of coastal development
SPECIFIC CONSERVATION NEEDS	- up-to-date information about status, resources and threats to identify actual and potential uses, and determine area-specific management strategies
SOCIO-ECONOMIC CONFLICTS	Some people may depend on mangroves for part of their livelihood (e g charcoal burners, bark gatherers)
PRIORITY LEVEL FOR ST ELIZABETH	High
SUGGESTED ACTIONS	- Base-line survey (to determine current status of all remaining patches of mangrove) - Monitoring programme (to determine changes in response to management) - Implementation of area-specific management strategies and zoning (including Tree Preservation Orders and restoration of special sites such as Broad River corridor) - Clean up campaigns as necessary - Moratorium on development in coastal and riverine mangroves - Maintenance of the connection between Parottee Pond and the sea - Education campaign and interpretive displays about the importance of mangroves, including a boardwalk and viewing tower
SOURCES	Proctor (1983) Haynes-Sutton and Proctor (1992)

Table 7 13. Mangrove - impacts and suggested management strategies

CATEGORY OF IMPACTS	IMPACTS	RECOMMENDED MANAGEMENT STRATEGY
Dredging (channels marinas ports and hotel beaches) (e g to facilitate boat traffic at Black River)	- Creates problem of disposal of spoil - Creates sediment	- Impact assessments should be required - Consider whether increased port activity in Black River is appropriate
Channelization and diversion of freshwater (e g to support agriculture in the Upper and Lower Morasses)	- Increases bank erosion and thus siltation of estuaries - diversion of freshwater out of the river system could increase salinity in Black River Bay and affect fisheries	- Discourage changes in freshwater regime
Blocking of lagoon mouths (e g Parottee, Font Hill)	- Destroys connection with sea eliminating contribution to marine productivity and fisheries	- Maintain natural connection
Reclamation and filling of wetlands for agriculture industry aquaculture agriculture or ports	- Can result in serious decline in coastal productivity	- Should be carefully evaluated before any action is permitted
Construction of retaining walls groins docks piers causeways and roads	- Can interrupt natural water flow patterns and tidal flushing - Can obstruct natural migration routes - Can interfere with Long shore sediment transport	- Should be avoided where possible - Where development is essential mitigation measures should be required
Extraction of water for drinking and agriculture	- Can disrupt water balance and increase saline intrusion cause subsidence of peat soils disrupt fisheries	- Evaluate water balance of Black River system (see EPF) - Allow extraction of water if this can be done without upsetting balance
Plantations (e g sugar)	- Can contribute to erosion of banks and pollution	- Require belts of natural vegetation along river courses - Do not allow critical habitats such as reed beds to be converted for agriculture
Solid Waste Disposal (e g in most mangroves near roads)	- Inhibits regeneration - Can release dangerous pollutants - Contributes to visual pollution	- Stimulate clean ups seek for root causes

Liquid waste disposal	- In some cases release into morass could be best practice	- Must be preceded by studies to determine how much the wetland community can process and the best techniques - Must be carefully monitored

7-3 Resources (next page)

Table 7 14 Freshwater Fishery (fish, shrimps, crabs)	
DESCRIPTION	Important in Upper and Lower Morasses also Wallywash Mostly artisinal Some sport fishing
SIGNIFICANCE	Of considerable local economic importance
LEGAL STATUS AND POLICY	Not regulated
THREATS	
Natural	Not determined
Man-related	Possible over-harvest because of abandonment of traditional fishing seasons and commercial crab catching Sea and river pollution Habitat disturbance (including reduction of vegetation as a result of boat tours) Changes in water regimes and channels Tour boats tend to swamp small fishing canoes Improved marketing and processing could improve economic returns
Potential	Not known
SPECIFIC CONSERVATION NEEDS	Scientific study of fishery identification of scale and nature of threats recommendations for enhancement of fishery Evaluation of sport fishery
SOCIO-ECONOMIC CONFLICTS	Other uses of the wetlands and rivers threaten traditional fishing (e g boat tours proposed abstraction of water for irrigation proposed drainage of wetland for agriculture)
PRIORITY LEVEL FOR ST ELIZABETH	Very High
RESEARCH NEEDED	Resource assessment Techniques for enhancement
MONITORING NEEDED	Catches number of fishermen number of fish traps (Antillean fences) shrimp pots and crab pots in use species and size of shrimp for sale by month
MANAGEMENT NEEDED	To be determined
SUGGESTED ACTIONS	Commission necessary studies Work with stakeholders to develop marketing and processing projects Consider licensing fishermen with higher charges for sports fishermen
SOURCES	Proctor (1983) Haynes-Sutton and Proctor (1992)

Table 7 15 Marine Fisheries	
DESCRIPTION	- Artisanal inshore fishery based at 12 fishing beaches - Commercial and artisinal fishing on south coastal banks (Pedro New Blossom and Walton)
SIGNIFICANCE	
LEGAL STATUS AND POLICY	Governed by Fishing Industry Act
THREATS	
Natural	
Man-related	- Over-fishing - Inappropriate fishing methods (fish guns, fish pots, small mesh seine nets) - Marine pollution - Destruction and disturbance of wetlands and other nursery areas
Potential	- Increased habitat destruction (specially of wetlands such as Parottee Ponds)
SPECIFIC CONSERVATION NEEDS	- Ensuring that the connection between Parottee Pond and the sea is maintained - Increased minimum mesh size for fish pots and nets
SOCIO-ECONOMIC CONFLICTS	- Fishing is an important primary and secondary source of income
PRIORITY LEVEL FOR ST ELIZABETH	High
RESEARCH NEEDED	- Location and relative importance of fish nurseries - Potential for deep sea fishing - Assessment of shark and ray populations and associated risks to bathers
MONITORING NEEDED	- Catch and effort surveys at fishing beaches - Socio-economics of fishing
MANAGEMENT NEEDED	- Creation of fish sanctuaries as necessary - Provision of mooring buoys as necessary - Designation of boat channels if necessary
SUGGESTED ACTIONS	- Encourage formation of fishing cooperatives on beaches that do not already have them - Develop Black River Marine Fisheries Management Council (with representatives from fishing coops and other stake holders) - Discuss agree and implement a management strategy for marine fishing for the area - Institute measures as necessary
SOURCES	Proctor (1983) Aiken (1992) Haynes-Sutton and Proctor (1992)

ANNEX A1 BIRDS OF BLACK RIVER LOWER MORASS (including Parottee Pond and Font Hill) (Source Haynes-Sutton 1992)
N b Species in ***bold*** are endemic to Jamaica

Podicipediadae
Tachybaptus dominicensis LEAST GREBE
Podilymbus podiceps PIED-BILLED GREBE
Pelecanidae
Pelecanus eurythrorhynchus AMERICAN WHITE PELICAN
Pelecanus occidentalis BROWN PELICAN
Phalacrocoracidae
Phalacrocorax auritus DOUBLE-CRESTED CORMORANT
Fregatidae
Fregata magnificens MAGNIFICENT FRIGATEBIRD
Ardeidae
Botaurus lentiginosus AMERICAN BITTERN
Ixobrychus exilis LEAST BITTERN
Ardea herodias GREAT BLUE HERON
Casmerodius albus GREAT EGRET
Egretta thula SNOWY EGRET
Egretta caerulea LITTLE BLUE HERON
Egretta tricolor TRICOLOURED HERON
Egretta rufescens REDDISH EGRET
Bubulcus ibis CATTLE EGRET
Butorides striatus GREEN-BACKED HERON
Nycticorax nycticorax BLACK-CROWNED NIGHT-HERON
Nycticorax violaceus YELLOW-CROWNED NIGHT-HERON
Eudocimus albus WHITE IBIS
Threskiornornithidae
Plegadis falcinellus GLOSSY IBIS
Ajaia ajaia ROSEATE SPOONBILL
Phoenicopteridae
Phoenicopterus ruber GREATER FLAMINGO
Anatidae
Dendrocygna bicolor FULVOUS WHISTLING DUCK
Dendrocygna arborea WEST INDIAN WHISTLING-DUCK
Aix sponsa WOOD DUCK
Anas creca GREEN-WINGED TEAL
Anas platyrhynchos MALLARD
Anas bahamensis WHITE-CHEEKED PINTAIL
Anas discors BLUE-WINGED TEAL
Anas cyanoptera CINNAMON TEAL
Anas clypteata NORTHERN SHOVELLER
Anas americana AMERICAN WIGEON
Aythya valisineria CANVASBACK
Aythya americana REDHEAD
Aythya collaris RING-NECKED DUCK
Aythya affinis LESSER SCAUP
Bucephala albeola BUFFLEHEAD
Oxyura jamaicensis RUDDY DUCK
Nomonyx dominica MASKED DUCK
Cathartidae
Cathartes aura TURKEY VULTURE
Accipitridae
Pandion haliatus OSPREY
Circus cyaneus NORTHERN HARRIER
Accipiter striatus SHARP-SHINNED HAWK
Buteo platypterus BROAD-WINGED HAWK
Buteo jamaicensis RED-TAILED HAWK
Falconidae
Falco sparverius AMERICAN KESTREL
Falco columbarius MERLIN
Falco peregrinus PEREGRINE FALCON
Rallidae
Laterallus jamaicensis BLACK RAIL
Rallus longirostris CLAPPER RAIL
Porzana carolina SORA
Porzana flaviventer YELLOW-BREASTED CRAKE
Paradirallus maculatus SPOTTED RAIL
Amaurolimnas concolor UNIFORM CRAKE
Porphyrula martinica PURPLE GALLINULE
Gallinula chloropus COMMON MOORHEN
Fulica americana AMERICAN COOT
Fulica caribaea CARIBBEAN COOT
Aramidae
Aramus guarauna LIMPKIN

Charadriidae	
Pluvalis squatarola	BLACK-BELLIED PLOVER
Pluvalis dominica	LESSER GOLDEN PLOVER
Charadrius alexandrinus	SNOWY PLOVER
Charadrius wilsonia	WILSON S PLOVER
Charadrius semipalmatus	SEMIPALMATED PLOVER
Charadrius melodus	PIPING PLOVER
Charadrius vociferus	KILLDEER
Haematopus palliatus	AMERICAN OYSTERCATCHER
Haemotopodidae	
Himanotopus mexicanus	COMMON STILT
Recurvirostridae	
Recurvirostra americana	AMERICAN AVOCET
Jacanidae	
Jacana spinosa	NORTHERN JACANA
Scolopacidae	
Tringa melanoleuca	GREATER YELLOWLEGS
Tringa flavipes	LESSER YELLOWLEGS
Tringa solitaria	SOLITARY SANDPIPER
Caloptrophorus semipalmatus	WILLET
Actitis macularia	SPOTTED SANDPIPER
Numenius phaeopus	WHIMBREL
Numenius americanus	LONG-BILLED CURLEW
Limosa fedoa	MARBLED GODWIT
Arenaria interpres	RUDDY TURNSTONE
Calidris alba	SANDERLING
Calidris pusilla	SEMIPALMATED SANDPIPER
Calidris mauri	WESTERN SANDPIPER
Calidris minutilla	LEAST SANDPIPER
Calidris fuscicollis	WHITE-RUMPED SANDPIPER
Calidris melanotos	PECTORAL SANDPIPER
Calidris alpina	DUNLIN
Calidris himantopus	STILT SANDPIPER
Limnodromus griseus	SHORT-BILLED DOWITCHER
Limnodromus scolopaceus	LONG-BILLED DOWITCHER
Gallinago gallinago	COMMON SNIPE
Phalaropus tricolor	WILSON S PHALAROPE
Stercorariidae	
Stercorarius parasiticus	PARASITIC JAEGER
Laridae	
Larus atricilla	LAUGHING GULL
Larus delawarensis	RING-BILLED GULL
Larus argentatus	HERRING GULL
Sterna nilotica	GULL-BILLED TERN
Sterna caspia	CASPIAN TERN
Sterna maxima	ROYAL TERN
Sterna sandvincensis	SANDWICH TERN
Sterna dougalli	ROSEATE TERN
Sterna hirundo	COMMON TERN
Sterna forsteri	FORSTER'S TERN
Sterna antillarum	LEAST TERN
Sterna anaethetus	BRIDLED TERN
Sterna fuscata	SOOTY TERN
Chlidonias niger	BLACK TERN
Anous stolidus	BROWN NODDY
Columbidae	
Columba leucocephala	WHITE-CROWNED PIGEON
Zenaida asiatica	WHITE-WINGED DOVE
Zenaida aurita	ZENAIDA DOVE
Zenaida macroura	MOURNING DOVE
Columbina passerina	COMMON GROUND DOVE
Leptotila jamaicensis	CARIBBEAN DOVE
Geotrygon montana	RUDDY QUAIL DOVE
Psittidae	
Aratinga nana	JAMAICAN PARAKEET
Forpus passerinus	GREEN-RUMPED PARROTLET
Amazona collaria	YELLOW-BILLED PARROT
Cuculidae	
Coccyzus erythropthalmus	BLACK-BILLED CUCKOO
Coccyzus americanus	YELLOW-BILLED CUCKOO
Coccyzus minor	MANGROVE CUCKOO
Crotophaga ani	SMOOTH-BILLED ANI
Tytonidae	
Tyto alba	COMMON BARN OWL
Strigidae	
Pseudoscops grammicus	JAMAICAN OWL
Caprimulgidae	
Chordeiles gundlachii	ANTILLEAN NIGHTHAWK
Caprimulgus carolinesis	CHUCK-WILL S WIDOW

Nytibidae	
Nyctibius griseus	JAMAICAN POTOO
Apodidae	
Cypseloides niger	BLACK SWIFT
Streptoprocne zonaris	WHITE-COLLARED SWIFT
Tachornis phoenicobia	ANTILLEAN PALM SWIFT
Trochilidae	
Anthracothorax mango	JAMAICAN MANGO
Trochilus polytmus	RED-BILLED STREAMERTAIL
Melissuga minima	VERVAIN
Todidae	
Todus todus	JAMAICAN TODY
Alcedinidae	
Ceryle alcyon	BELTED KINGFISHER
Picidae	
Melanerpes radiolatus	JAMAICAN WOODPECKER
Sphyrapicus varius	YELLOW-BELLIED SAPSUCKER
Tyrannidae	
Myiopagis cotta	JAMAICAN ELAENIA
Contopus palidus	JAMAICAN PEWEE
Myiarchus barbirostris	SAD FLYCATCHER
Myiarchus validus	RUFOUS-TAILED FLYCATCHER
Myiarchus stolidus	STOLID FLYCATCHER
Tyrannus dominicensis	GRAY KINGBIRD
Tyrannus caudifasciatus	LOGGERHEAD KINGBIRD
Hirundinidae	
Progne dominicensis	CARIBBEAN MARTIN
Tachycineta bicolor	TREE SWALLOW
Stelgidopteryx serripennis	NORTHERN ROUGH-WINGED SWALLOW
Riparia riparia	BANK SWALLOW
Hirundo fulva	CAVE SWALLOW
Hirundo rustica	BARN SWALLOW
Muscipcapidae	
Catharus minimus	GRAY-CHEEKED THRUSH
Catharus ustulatus	SWAINSON'S THRUSH
Turdus aurantius	WHITE-CHINNED THRUSH
Dumetella carolinensis	GRAY CATBIRD
Mimus polyglottos	NORTHERN MOCKINGBIRD
Sturnidae	
Sturnus vulgaris	EUROPEAN STARLING

Vireonidae	
Vireo griseus	WHITE-EYED VIREO
Vireo modestus	JAMAICAN VIREO
Vireo flavifrons	YELLOW THROATED VIREO
Vireo olivaceus	RED EYED VIREO
Vireo altiloquus	BLACK WHISKERED VIREO
Emberizidae	
Vermivora peregrina	TENNESSEE WARBLER
Parula americana	NORTHERN PARULA
Dendroica petechia	YELLOW WARBLER
Dendroica magnolia	MAGNOLIA WARBLER
Dendroica tigrina	CAPE MAY WARBLER
Dendroica caerulescens	BLACK-THROATED BLUE WARBLER
Dendroica coronata	YELLOW RUMPED WARBLER
Dendroica dominica	YELLOW-THROATED WARBLER
Dendroica discolor	PRAIRIE WARBLER
Dendroica palmarum	PALM WARBLER
Dendroica striata	BLACKPOLL WARBLER
Mniotilta varia	BLACK AND-WHITE WARBLER
Setophaga ruticilla	AMERICAN REDSTART
Pronotaria citrea	PROTHONOTARY WARBLER
Helmitheros vermivorus	WORM-EATING WARBLER
Limnothylypis swainsonii	SWAINSON'S WARBLER
Vermivora pinus	BLUE-WINGED WARBLER
Seiurus aurocapillus	OVENBIRD
Seirus noveboracensis	NORTHERN WATERTHRUSH
Seirus motacilla	LOUSIANA WATERTHRUSH
Wilsonia canadensis	CANADA WARBLER
Geothylipis trichas	COMMON YELLOWTHROAT
Coereba flaveola	BANANAQUIT
Euphonia jamaica	JAMAICAN EUPHONIA
Spindalis zena	STRIPE HEADED TANAGER
Passerina cyanea	INDIGO BUNTING
Tiaris olivacea	YELLOW-FACED GRASSQUIT
Tiaris bicolor	BLACK FACED GRASSQUIT
Loxipasser anoxanthus	YELLOW-SHOULDERED GRASSQUIT
Loxigilla violacea	GREATER ANTILLEAN BULLFINCH
Euneornis campestris	ORANGEQUIT

Sicalis flaveola	SAFFRON FINCH	Endemic species 15
Ammodramus savannarum	GRASSHOPPER SPARROW	Endemic sub-species 14
Dolichonyx oryzivorus	BOBOLINK	Introduced species 3
Quiscalus niger	GREATER ANTILLEAN GRACKLE	Resident species 44
Icterus leucopteryx	JAMAICAN ORIOLE	Summer residents 8
Icterus galbula	NORTHERN ORIOLE	Summer migrants 1
		Winter migrants 52
Total species 197		Winter Transients 21
		Winter Vagrants 27
Global distribution index total 486		
Jamaican distribution index total 504		Rare species 60 (31%)

APPENDIX A-2 TELEOST FISH SPECIES FROM THE BLACK RIVER LOWER MORASS AND ASSOCIATED HABITATS

N b Species in ***bold*** are endemic to Jamaica (Sources - NRCD 1981 Aiken 1982 Karlsson and Leonardson 1984)

SCIENTIFIC NAME	COMMON NAME	HABITAT
*Tilapia mossambica**	African perch	Freshwater/brackish
*Centropomus undecimalis**	Snook	Brackish/freshwater
Gambusia wrayi	Top minnow	Freshwater
*Gerres cinereus**	Yellowfin mojarra	Brackish
*Caranx latus**	Horseye jack	Brackish/marine
*Lutjanus griseus**	Grey snapper	Brackish/freshwater
Achirus lineatus	Lined sole	Brackish
Gambusia oligosticta	Spotted minnow	Freshwater
Elops saurus	Ladyfish	Brackish
*Umbrina coroides**	Sand drum	Brackish
Cetengraulis edentulus	Atlantic anchoveta	Brackish
Megalops atlanticus	Atlantic tarpon	Brackish
Gobiomorus dormitor	Bigmouth sleeper	Brackish/Freshwater
*Polydactylus virginicus**	Barbu threadfin	Brackish
Diapterus rhombeus	Caitipa mojarra	Brackish
Limia melanogaster	Blue-bellied limia	Freshwater
*Anguilla rostrata**	American eel	Brackish/freshwater
*Mugil curema**	White mullet	Brackish
Cubanicthys pengelleyi	St Elizabeth minnow	Freshwater
Aetobatis narinari	Spotted eagle ray	Brackish/marine
Albula vulpes	Bonefish	Brackish
Caranx hippos	Crevalle jack	Brackisn
*Diapterus rhombe s**	Silver mojarra	Brackish
Eucinostomus argentus	Spotfin mojarra	Brackish

*Awaous tajasica**	Bullhead/mudfish	Freshwater/brackish
Lutjanus jocu	Dogtooth snapper	Brackish
*Dormitator maculatus**	Sleeper goby	Freshwater/brackish
Gymnothorax moringa	Spotted moray	Brackish/marine
Mugil cephalus	Queen mullet	Brackish
Mugil lisa	Liza	Brackish
Strongylura timucu	Gar	Brackish/marine
Sphyraena barracuda	Great barracuda	Brackish/marine
Lutjanus apodus	Schoolmaster snapper	Marine/brackish
Eleotris spp	Unidentified mudfish	Freshwater/brackish
*Bairdiella chrysoura**	Silver croaker	
*Epinephelus itajara**	Jewfish	

Total number of fish species 37, Endemic species 3 (%) (of which 2 species Cubanichthys and Limia are only found in Jamaica)
* commercially important species (16), Total species 38

ANNEX A-3 ELASMOBRANCH FISH SPECIES OF BLACK RIVER LOWER MORASS AND ENVIRONS
Ginglymostoma cirratum

ANNEX A-4 INVERTEBRATES
DECAPOD CRUSTACEANS (Shrimp) (Source NRCD, 1979 and PCJ 1984)

	Mean weight in commercial catch (g)
Macrobrachium acanthurus	7 7
M faustinum	4 8
M carcinus	21 6
Jonga serrei	4 7
Xiphocaris elongata	-
Unidentified sp A (prob *Ataya*)	-
Unidentified sp B (prob *Ataya*)	-

ANNEX A-5 COELENTERATA OF FONT HILL (Source Hendry 1982)
Acropora palmata
Agaricia sp
Briareum asbestinum
Diploria sp
Montastrea annularis
Millepora sp
Porites porites
Siderastrea siderea

ANNEX A-6 AMPHIBIANS AND REPTILES OF BLACK RIVER LOWER MORASS AND ENVIRONS

N b Species in ***bold*** are endemic to Jamaica

CLASS Amphibia
- ORDER Anura (Frogs and toads)
  - FAMILY **Ranidae**
    - *Rana catesbeiana*
  - FAMILY **Bufonidae**
    - *Bufo marinus*
  - FAMILY **Leptodactylidae**
    - ***Eleutherodactylus cundalli***
    - ***Eleutherodactylus glaucoreius***
  - FAMILY **Hylidae**
    - ***Hyla brunnei***

CLASS Reptilia
- 0RDER **Crocodilia**
  - *Crocodylus acutus* American Crocodile
- ORDER Testudines (Turtles)
  - FAMILY **Emydidae**
    - *Trachemys terrapen* Jamaican Slider (Pond Turtle)
  - FAMILY **Chelonidae**
    - *Chelonia mydas* Green Turtle
    - *Eretmochelys imbricata* Hawksbill
  - FAMILY **Dermochelidae**
    - *Dermochelys coriacea* Leatherback
- ORDER Squamata (Lizards)
  - FAMILY **Gekkonidae**
    - ***Aristelleger praesignis***
  - FAMILY **Iguanidae**
    - ***Anolis garmani***
    - ***Anolis grahami***
    - ***Anolis lineatopus***
    - ***Anolis opalinus***
    - *Anolis sagrei*
    - ***Anolis valencienni***
  - FAMILY **Anguidae**
    - *Celestus crusculus*
    - ***Celestus occiduus*** ?

ORDER Squamata (Snakes)
- FAMILY **Typhlopidae**
  - ***Typhlops jamaicensis***
- FAMILY **Colubridae**
  - ***Arryhyton callilaemum***

ANNEX A-7 PLANTS OF BLACK RIVER LOWER MORASS (including Parottee Pond and Font Hill) (Sources Proctor 1986, NRCD 1982 Coke et al 1983, Hendry, 1988)

KEY

SF - *Swamp forest*
RF - *Riverine forest*
MA - *Mangrove woodland*
HS - *Herbaceous swamp*
AQ - *Aquatic*
LI - *Limestone islands (including ponds)*
CW - *Coastal woodland*
DL - *Dry Limestone forest*
Roystonea princeps - *Endemic species*
R - Rare species
RJ - Species which is rare in Jamaica
L - Local endemic (found only in Black River)

	SF	RF	MA	HS	AQ	LI	CW	DL
MONOCOTS								
Alismataceae								
Sagittaria guayanesis R						LI		
Sagittaria lancifolia				HS	AQ			
Amaranthaceae								
Amaranthus australis				HS				
Amaryllidaceae								
Crinum americanum	SF	RF		HS				
Araceae								
Syngonium auritum	SF							
Dieffenbachia seguine	SF							
Philodendron lacerum	SF							
Bromeliaceae								
Hohenbergia sp	SF							
Tillandsia fasciculata	SF							
Tillandsia recurvata						LI		
Tillandsia usneoides						LI		
Cyperaceae								
Cladium jamaicense				HS				
Cyperus articulatus				HS				
C giganteus				HS				
C ligularis				HS				
C ochraceus				HS				
C polystachyos				HS				
C procerus v lasiorrhachis				HS				
C uniloides				HS				
Eleocharis cellulosa				HS				
E elegans				HS				
E geniculata				HS				

	SF	RF	MA	HS	AQ	LI	CW	DL
E mutata				HS				
Fuirena umbellata				HS				
Fimbristylis autumnalis R				HS				
Fimbristylis spadica				HS				
Rhynchospora colorata				HS				
R corymbosa				HS				
R cyperioides				HS				
R fascicularis				HS				
R globularis v recognita				HS				
R inundata				HS				
R nervosa				HS				
R nitens				HS				
R odorata				HS				
R fascicularis				HS				
Scirpus americanus				HS				
Scirpus validus				HS				
Scleria macrophylla				HS				
Scleria setulosa-ciliata				HS				
Graminae								
Andropogon glomeratus				HS				
Andropogon pertusus				HS				
Chloris petraea				HS				
Cynodon dactylon						LI		
Dactyloctenium aegyptum						LI		
Echinochloa crus-galli						LI		
Eragrostis elliotti				HS				
Erianthus giganteus				HS				
Gynerium sagittatum				HS				
Hemarthria altissima				HS				
Hymenachne amplexicaulis				HS				
Leersia hexandra				HS				
Panicum acuminatum				HS				
Panicum condensum				HS				
P elephantipes	SF			HS				
P maximum				HS				
P muticum				HS				
P roanokense				HS				
P stenodes				HS				
Paspalidum zizanoides				HS				

	SF	RF	MA	HS	AQ	LI	CW	DL
Paspalum distichum				HS				
Paspalidum geminatum					AQ			
Pennisetum purpureum				HS				
Phragmites australis				HS				
Reynaudia filiformis R				HS				
Sacciolepis striata				HS				
Sporobolus virginicus							CW	
Hypoxidaceae								
Curculigo scorzonerifolia R					AQ			
Lemnaceae								
Spirodela polyrhiza	SF				AQ			
Wolffiella welwitschii					AQ			
Najadaceae								
Najas guadalupensis					AQ			
Najas marina				HS				
Marantaceae								
Thalia geniculata				HS				
Orchidacae								
Bletia purpurea				HS				
Oncidium luridum						LI		
Broughtonia negrilensis						LI		
Broughtonia sanguinea						LI		
Palmae								
Calyptronoma occidentalis	**SF**							
Cocos nucifera						LI		
Roystonea princeps	**SF**							
Sabal jamaicensis				HS		LI		
Pontederidaceae								
Eichhornia crassipes					AQ			
Potamogetonaceae								
Potamogeton fluitans					AQ			
Potamogenton nodosus					AQ			
Potamogeton illinoensis					AQ			
Typhaceae								
Typha domingensis				HS				
Zingiberaceae								
Alpinia allughas	SF			HS				

200

	SF	RF	MA	HS	AQ	LI	CW	DL
DICOTS								
Acanthaceae								
Ruellia tuberosa								
Amaranthaceae								
Achryanthes indica						LI		
Amaranthus cannabinus						LI		
Amaranthus australis				HS				
Anacardiaceae								
Mangifera indica		RF						
Annonaceae								
Annona glabra	SF	RF						
Apocynaceae								
Plumeria obtusa							CW	
Rhabdadenia biflora	SF			HS				
Aristolochiaceae								
Aristolochia trilobata	SF							
Asclepiadaceae								
Sarcostemma clausum			MA					
Avicenniaceae								
Avicennia germinans			MA					
Bignonaceae								
Enalagma latifolia	SF							
Tanaecium jaroba		RF						
Tabebuia riparia	SF							
Boraginaceae								
Bourreria venosa	SF							
Heliotropium lagoense R						LI		
Burseraceae								
Bursera simaruba								DL
Cactaceae								
Selenicereus grandiflorus						LI		
Caesalpinaceae								
Caesalpinia major								
Haemotoxylum campechianum							CW	
Ceratophyllaceae								
Ceratophyllum demersum					AQ			
Ceratophyllum muricatum					AQ			
Combretaceae								
Bucida buceras	SF							
Combretum laxum	SF	RF						

	SF	RF	MA	HS	AQ	LI	CW	DL
Combretum robinsonii			MA					
Conocarpus erectus			MA					
Langucularia racemosa			MA					
Terminalia latifolia	SF							
Compositae				HS				
Mikania micrantha						LI		
Pectis linearis R						LI		
Pluchea rosea						LI		
Sachsia polycephala R								
Struchium spargonophora								
Convulvulaceae						LI		
Aniseia martinicensis				HS		LI		
Cuscuta americana						LI		
Ipomoea sagittata R	SF							
Ipomoea acuminata	SF							
Cucurbitaceae								
Melothria guadalupensis	SF							
Euphorbiaceae						LI		
Gymnanthes lucida				HS				
Caperonia castaneifolia						LI		
Croton linearis						LI		
Euphorbia hirta						LI		
Euphorbia prostrata								
Flacourtiaceae								
Homalium racemosum	SF							
Gentianaceae						LI		
Schultesia guianensis R								
Guttiferaceae								
Symphonia globulifera	SF							
Halorhagidaceae								
Myriophyllum pinnatum RJ				HS				
Lauraceae								
Nectandra antillana	SF	RF						
Leguminosae				HS				
Aeschynomene ciliata						LI		
Pterocarpus sp				HS				
Sesbania emerus								
Lecythidaceae								
Grias cauliflora R	SF							

	SF	RF	MA	HS	AQ	LI	CW	DL
Lentibulariaceae								
Utricularia foliosa					AQ			
Utricularia purpurea R					AQ			
Malvaceae								
Hibiscus elatus	SF							
Hibiscus striatus v lambertianus R				HS				
Pavonia sp	SF							
Sida acuta							CW	
Sida procumbens							CW	
Mimosaceae								
Acacia tortuosa							CW	DL
PithecelLbium unguis-cati							CW	DL
Moraceae								
Ficus maxima	SF							
Myrsinaceae								
Wallenia venosa	SF							
Myrtaceae								
Calyptranthes chytraculia						LI		
Eugenia fadyenii	SF							
Melaleuca leucodendron				HS				
Najadaceae								
Najas marina					AQ			
Nymphaceae								
Brasenia schreberi					AQ			
Cabomba piauhiensis					AQ			
Nymphaea ampla					AQ			
Nymphaea amazonum RJ					AQ			
Nymphaea jamesoni RJ					AQ			
Nymphiodes indica					AQ			
Onagraceae								
Ludwigia inclinata RJ						LI		
Ludwigia leptocarpa	SF				AQ			
Ludwigia sp					AQ			
Ludwigia peploides								
Ludwigia repens				HS	AQ			
Ludwigia simpsonii					AQ			
Passifloraceae								
Passiflora penduliflora	SF							

	SF	RF	MA	HS	AQ	LI	CW	DL
Papilionaceae								
Andira inermis	SF							
Canavalia rosea							CW	
Haemotoxylon campechianum						LI	CW	DL
Lonchocarpus latifolius							CW	
Lonchocarpus sericeus	SF	RF						
Lonchocarpus sp R L	SF							
Piscidia piscipula								DL
Samanea saman		RF						DL
Stylosanthes hamata								DL
Teramnus volubilis								DL
Poygalaceae								
Polygala leptocaulis R				HS				
Polygonaceae								
Coccoloba uvifera							CW	
Rhizophoraceae								
Rhizophora mangle			MA	HS				
Rubiaceae								
Guettarda argentea	SF							
Morinda royoc	**SF**							
Psychotria sloanei	SF							
Randia aculeata	SF							
Sapindaceae								
Blighia sapida						LI		
Sapotaceae								
Chrysophyllum oliviforme						LI		
Forestieria rhamnifolia v pilosa								DL
Manilkara sideroxylon						LI		
Manilkara zapota						LI		
Sideroxylon foetidissium						LI		
Scrophulariaceae								
Angelonia angustifolia RJ						LI		
Cheilophyllum jamaicense R						LI		
Umbelliferae								
Centella asiatica				HS				
Hydrocotyle umbellata				HS				
Urticaceae								
Boehmeria cylindrica				HS				
Visaceae								
Dendrophthora nuda R						LI		

	SF	RF	MA	HS	AQ	LI	CW	DL
Verbenaceae								
Lippia nodiflora					HS			
Stachytarpheta angustifolia						LI		
Zygophyllaceae								
Tribulus cistoides							CW	
PTERIDOPHYTES								
Polypodiaceae								
Acrostichum aureum			MA					
Acrostichum danaeifolium			MA					
Blechnum indicum	SF							
Thelypteris interrupta						LI		
Thelypteris normalis	SF							
Thelypteris serrata	**SF**							
Marsileaceae								
Marsilea polycarpa								

Annex B Existing and Potential Regulatory Framework for Black River

THEME	LAW	MANAGEMENT INTERESTS	RELEVANT AREAS AND ACTIONS	RESPONSIBLE ORGANIZATION
Administration of protected natural and heritage areas and structures	NRCA Act	Declaration and management of protected areas	To be determined	NRCA
	Wild Life Protection Act	Declaration and management of Game Reserves and Sanctuaries	Font Hill Black River Lower Morass Parottee	NRCA
	Jamaica National Heritage Trust Act	Declaration and management of protected national heritage and monument	Various structures mostly in Black River	JNHT
	Forests Act	Declaration and management of Forest Reserves	Yardley Chase Bogue	FSCD
		Declaration of any Crown Land as protected area	None	FSCD
	Public Gardens Act	Management of Public Gardens	Bamboo Avenue	Spt of Gardens
Biodiversity conservation	Wild Life Protection Act	Specifies protected animals	N/A	NRCA
	NRCA Act	Requires recovery action Plans	Manatees Sea Turtles Crocodiles	NRCA Advisory Committees
	Country Fires Act	Prohibits setting of fires without licence in designated areas	?	
	Forest Act	Licences saw mills		FSCD
Integrated coastal resource management	Town and Country Planning Act	Development plans and orders *sub division approval*	St Elizabeth Development Order	TCPD
	NRCA Act	Requires EIAs permits and licences for specified activities	Whole island	NRCA
	NRCA Act	Regulates discharge of liquid or solid wastes without licence	?	NRCA
	Beach Control Act	Regulates use of foreshore		NRCA

THEME	LAW	MANAGEMENT INTERESTS	RELEVANT AREAS AND ACTIONS	RESPONSIBLE ORGANIZATION
	Beach Control Act	Management of beaches	Designated Public Bathing beaches at Crane Road Parottee Thatchfield Fort Charles Treasure Beach	NRCA
	Harbours Act	Declaration of harbours control of discharge into harbours	?	Port Authority
	Local Improvement Act	Sub-division of lands stipulates that all buildings within one mile of sea must be approved by Beach Control Authority (NRCA)	Whole area specially one mile inland	St Elizabeth Parish Council
	Litter Act	*Prohibits dumping in any public place or on private land* without permission		
Fisheries management	Fishing Industry Act	Licenses fishermen	*To be amended*	FD
		Declares fishing beaches?		FD
		Declares Fish Sanctuaries	None	FD
	Wild Life Protection Act	Regulates fishing methods in rivers	Black River Z traps Fish pots	NRCA
Water resources management	Water Resources Act	Regulates allocates conserves and manages water *resources*		WRA
		Water Resources Master Plan		WRA
	Watershed Protection Act	Provides for regulation of protected watersheds	Whole island no regulations	NRCA
	Flood water Control Act	Declaration of flood-water control areas	?	?
	Irrigation Act	Declaration of irrigation areas and autnorities prohibits blocking waterways unlawful removal of water	?	?
	National Water Commission Act	Coordinates waters supplies Contruction of sewage schemes		NWC
	Forestry Act	Declaration of protected areas	None	FoD

THEME	LAW	MANAGEMENT INTERESTS	RELEVANT AREAS AND ACTIONS	RESPONSIBLE ORGANIZATION
	Black River (Upper Morass) Reclamation Act	Black River Drainage and Irrigation Board to keep the river clean effect requires land owners to clean impose rates for keeping river clean	Black River Upper and Lower Morasses	?
	Mining Act	Prohibits pollution of water supply by mining Beach sand mining????		Mines and Quarries Division
	Quarries Control Act	Quarries licences can be denied if likely to affect water table or surface drainage		Mines and Quarries Division
	River Rafting Act	Regulates commercial river rafting	None	River Rafting Authority
	Roads Protection Act	Road authority may cut fell or burn any tree or undergrowth within 20 ft of watercourse		
	Public Health Act	Approves plans for waste disposal		
Pollution Control	NRCA Act	Prohibits discharge of waste without licence		NRCA
	Natural Resources Conservation (Permits and Licences) Regulations	Permitting system for pollution		NRCA
	Natural Resources Conservation (Environmental Protection and Waste Management) Regulations	Established mechanisms to protect the environment from pollution including mitigation measures and guidelines for management of hazardous substances and pesticides		NRCA Pesticides Authority
	Trade Effluent and Sewerage Effluent Regulations Waste Discharge Fee Regulations	Sets discharge limits and user fees for waste treatment		
	Litter Act	Prohibits dumping		
	Noise Abatement Act	Regulates noise nuisances		
	Harbours Act	Prohibits discharge of waste into harbours		

THEME	LAW	MANAGEMENT INTERESTS	RELEVANT AREAS AND ACTIONS	RESPONSIBLE ORGANIZATION
	Quarries Control Act	Establishes quarry zones controls licences for quarries (subject to environmental conditions)		
	Public Health Act	Broad powers relating to waste disposal in relation to public health		Ministry of Health
Planning and the built environment	Town and Country Planning Act	Development control		TCPD
	Minerals (Vesting) Act	Vests all minerals in the Crown		
	Land Acquisition Act	Provides for compulsory purchase of land		
	Land Development and Utilization Act	Declaration of idle land		Land Utilization Authority
	Land Improvement Act (see above)			
	NRCA Act and regulations (see above)			
Tourism and Recreation	Beach Control Act	Licence Life Guards		NRCA
	NRCA Act	Good conduct in listed areas		
		Construction on public recreational facilities		
	Jamaica Tourist Board Act	Regulation and licensing of dive boats boat tours tour guides attractions villas and hotels		Ministry of Tourism TPDCo
		Planning and control		South Coast Resort Board
	??			

ANNEX C

PROARCA/Coastas "Scorecard" for Monitoring and Evaluation

PROARCA/Costas "Scorecard" for M&E

1 SITE MANAGEMENT INDEX
(applied to coastal and marine protected areas and special management areas)

Part A Declaration and Management

1 1 Official Declaration

Legal status of the protected area

0 = No declaration
1 = Proposal in preparation for declaration of the area
2 = Technical studies done and complete proposal presented for declaration of the area
3 = Area is officially declared but boundaries are not correctly demarcated in the field
4 = Protected area is officially declared, and boundaries are correctly demarcated and maintained in the field

1 2 Priority Conservation Threats Identified and Addressed

Extent of identification and response to the activities and actors significantly threatening the natural resources of the area

0 = No threats identified or addressed
1 = Threat identification and prioritization underway
2 = Threats identified/prioritized but none addressed
3 = Threats identified/prioritized and a few have been or are being addressed
4 = Threats identified/prioritized and all priority threats have been or are being addressed

1 3 Management Plan Developed with Appropriate Participation

Extent of stakeholder participation in the development of the site management plan

0 = No management plan
1 = Management plan development in progress with little participation of local stakeholders
2 = Management plan development in progress with adequate participation of local stakeholders
3 = Management plan completed with adequate participation of local stakeholders
4 = Management plan completed and vetted with local and national stakeholders

1 4 Sufficient Resources Allocated to Implement Management Plan

Extent of resources allocated, or generated by appropriate resource uses, to implement the management plan

0 = No resources allocated
1 = Very limited resources allocated to implement a few activities
2 = Some resources allocated to implement about half of the planned activities
3 = Moderate resources allocated to implement about three quarters of the planned activities
4 = Adequate resources to implement all proposed activities

1 5 Management Actions Initiated

Extent of initiation of actions to implement the management plan

0= No management actions
1 = Very limited initiation of management action
2 = Some initiation of management actions
3 = Substantial initiation of management actions
4 = Extensive initiation of management actions

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Part B Better Resource Use Practices

1 6 Sustainable Resource Use Activities

Extent of involvement in environmentally and socially acceptable resource use activities / reduction in unsustainable activities

0 = no alternatives available to unsustainable resource use activities
1 = economic alternative(s) adopted by a few (<10%) resource users / small reduction in unsustainable activities
2 = economic alternative(s) adopted by more (10-40%+) resource users / moderate reduction in unsustainable activities
3 = economic alternative(s) broadly accepted (by >40% of resource users) / major reduction in involvement in unsustainable activities
4 = economic alternative(s) spread without outside assistance / unsustainable activites very rare or completely eliminated

Additional Information income levels before and after the development of economic alternatives

1 7 Compliance with Resource Use Regulations

Extent to which resource users comply with resource management laws, regulations and voluntary community norms that contribute to sustainable resource use

0 = Illegal activities very common, no compliance with laws, regulations and/or community norms
1 = Compliance by a few (<20% of) resource users
2 = Compliance by some (20-50% of) resource users
3 = Compliance by most (>50-90% of) resource users
4 = Clear evidence that illegal activity has ceased, general acceptance and compliance by all or almost all (>90% of) resource users

Part C Long-term Sustainability

1 8 Adaptive Management Demonstrated

Ability of the site management system to correct itself to respond to feedback and make informed decisions in response to threats and opportunities

0 = Actions do not respond to new information or conditions
1 = Actions respond to some new information or conditions, but response is difficult
2 = Actions respond to new information and conditions but only after some time
3 = Actions are quick to respond to new information and conditions
4 = Formal decision-making mechanisms established for responding to threats and opportunities

1 9 Long-term Financial Planning for Protected and Special Management Areas

Progress in the development of long-term financial plans

0 = No long-term financial plan
1 = Long-term financial planning process undertaken
2 = Long-term financial plan completed but not implemented
3 = Long-term financial plan completed and partially implemented
4 = Long-term financial plan completed and fully implemented

1 10 Local Investment

Degree to which there is direct local investment in natural resource management threat reduction or support of economic alternatives

0 = No investment
1 = Limited investment and no cost recovery

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2 = Moderate investment and no cost recovery
3 = Significant investment and limited cost recovery
4 = Significant continuing investment and established mechanisms for cost-recovery and/or economic returns

TABLE 1 STAGES OF PROGRESS TOWARDS COMPLETION OF PROTECTED AREA MANAGEMENT PLANS *results from this table would be fed into indicator 1 3)*	POINTS TOWARD COMPLETION OF FINAL OBJECTIVE (0-100)
1 Technical team formed to complete management plan	10
2 Secondary literature reviewed and consultations held with stakeholders to define the scope of the management plan	25
3 Field work conducted to gather relevant biophysical, socioeconomic, legal and institutional data	50
4 Draft management plan completed	70
5 Consultations held with local and national stakeholders to receive feedback on the draft management plan	90
6 Management plan completed and distributed to governmental agencies, NGOs and private sector groups	100

2 LOCAL PARTICIPATORY DECISION-MAKING ("GOVERNANCE") INDEX
(applied to key coastal resource management issues)

Part A Stakeholder Involvement in Decision-making

2 1 Stakeholder Group Involvement

Extent to which stakeholder groups are involved in decision-making on key natural resource management issues

0 = No stakeholder groups formed
1 = A few stakeholder groups present and weakly involved in decision-making
2 = A few user groups involved in decision-making
3 = Several user groups involved in decision-making
4 = Several stakeholder groups devise and legally implement important management rules

2 2 Institutional Capacity to Respond to Management Issues

Extent to which relevant governmental and non-governmental institutions have the capacity to respond to this key management issue

0 = Total absence of institutions capable of addressing management issue
1 = Institutions have minimal capacity to address the management issue
2 = At least one institution has a moderate capacity to address the issue
3 = At least one institution has a strong capacity to address the issue
4 = Several institutions have a strong capacity to address the issue

2 3 Agreement on Threats to Natural Resources Related to Key Management Issues

Extent of agreement among stakeholders on definition of principal threats (activities and actors) to natural resources related to key management issues

0 = principal threats (activities and actors) not defined
1 = stakeholders strongly disagree on principal threats
2 = general agreement between a few stakeholders on definition of major threats
3 = general agreement between a diverse array of stakeholders on definition of major threats
4 = consensus between local and national governmental authorities, non-governmental resource managers and stakeholders on definition of major threats

2 4 Transparency of Decision-making Processes

Degree to which the decision-making process is open

0 = Decision-making process centralized and hidden from public view
1 = Stakeholder groups begin to request information
2 = A small amount of information about costs/benefits or trade-offs (social, economic, or environmental) of decisions made available
3 = A moderate amount of information about costs/benefits or trade-offs (social, economic, or environmental) of decisions made available
4 = Stakeholder groups are aware of cost/benefits and how decisions are made

2 5 Conflict Resolution

Extent to which there are mechanisms for successful conflict resolution (progress towards collaboration or win-win outcomes through mutual understanding of needs and compromise in place of conflict avoidance competition or accomodation)

0 = No mechanisms established
1 = Attempts being made to establish mechanisms
2 = Mechanisms newly established but have not yet attained collaboration
3 = Mechanisms established and sometimes succeed

4 = Mechanisms formalized and operational

2 6 Multi-level Involvement and Vertical Linkage of Stakeholder Groups

Extent to which groups at all levels (grassroots and national) participate in decision-making and communicate vertically to strengthen policy implementation and/or policy reformulation

0 = involvement only at one level (grassroots or national)
1 = multi-level involvement but no vertical linkage
2 = steps taken toward vertical linkage
3 = multi-level involvement with weak vertical linkage
4 = multi-level involvement and strong vertical linkage

2 7 Co-management

Extent to which there are structures or mechanisms for successful public/private management of natural resources (ex agreements for joint administration, joint implementation of management plans)

0 = No structures or mechanisms established
1 = Attempts being made to establish structures or mechanisms
2 = Structures or mechanisms formally established but weakly implemented
3 = Structures or mechanisms established and sometimes succeed
4 = Structures or mechanisms established and often succeed

Part B Information Available and Used to Support Decision-making

2 8 Site Profile

Progress towards completion of PROARCA/Costas site profile

0 = no progress towards completion of site profile
1 = technical team formed, rapid assessment conducted of existing conditions and preliminary site profile produced
2 = information concerning current resource management gathered with adequate stakeholder participation
3 = draft text produced and feedback obtained from local and national stakeholders
4 = publication and distribution of site profile

2 9 Basic Conservation Information Needs Met

Extent to which conservation information needs have been identified and met

0 = needs essentially unknown by local resource managers and stakeholders
1 = conservation information needs identified by local resource managers and stakeholders
2 = conservation information needs identified and contact made with science/research organizations and funding sources to address these needs
3 = local/international scientific/research organizations and individuals coordinating with site management authorities to address at least one site information need
4 = local/international scientific/research organizations and individuals coordinating with site management authorities to address all priority site information needs

2 10 Monitoring Plan Developed and Implemented

Progress in the development and implementation of monitoring plans to measure the human activities that are contributing the most strongly to resource degradation, and to document progress in reducing these threats

0 = no monitoring of any significance underway
1 = some baseline information being gathered, but with no clear relation to monitoring needs

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2 = thorough monitoring plan developed identifying threat-related monitoring variables, but not yet implemented
3 = monitoring plan developed and baseline information being collected and analyzed
4 = timely monitoring information and analysis available to resource managers and stakeholders and being used for management purposes

2 11 Environmental Education Information Available to Stakeholders

Extent to which information about significant biophysical and socioeconomic aspects of the management issue is available in an appropriate form for environmental education

0 = no information available and no opportunities for training and technical assistance
1 = publications being produced and/or training opportunities planned that meet a few information needs
2 = publications and training opportunities available that meet a few information needs
3 = publications and training opportunities available that meet most information needs, but available within a few institutions or to a few people
4 = substantial information shared between institutions and available to stakeholders in an appropriate form

Additional Information # of publications produced and disseminated to appropriate constituencies, # of participants at training events

2 12 Stakeholders Understand and Utilize Information

Extent of stakeholder understanding of significant biophysical and socioeconomic aspects of the management issue and utilization of available information for management to support decision-making

0 = little or no understanding of the issue and/or use of available information
1 = a few stakeholders have a moderate understanding of the issue, but little application of available information
2 = a few stakeholders have a good understanding of the issue, but no application of available information
3 = many stakeholders have a good understanding of the issue, but little or no application of available information
4 = many stakeholders have a good understanding of the issue and utilize available information

Additional Information surveys to document changes in attitudes and knowledge and use of information for decision-making

3 ICM CAPACITY-BUILDING INDEX

3 1 ICM Training and Technical Assistance Materials Available

Extent of documentation of ICM methodologies

0 = no materials available in appropriate form
1 = some materials (case studies, workshop proceedings, concept papers, etc) available in draft form to a limited number of people
2 = some materials (case studies, workshop proceedings, concept papers, etc) finalized and broadly disseminated
3 = draft manual on ICM "best practices" completed and available to a limited number of people
4 = manual on ICM "best practices" finalized and broadly disseminated

3 2 Professional Capacity in ICM

Extent of professional capacity of GO and NGO partners in ICM

0 = NGO and GO partners have little or no experience in ICM

1 = initial training opportunities provided to several NGO and GO representatives

2 = most partners demonstrate some professional capacity through participatory issue identification, program preparation and formal adoption by local communities, government agencies and other stakeholders

3 = some partners demonstrate major progress through program implementation

4 = many partners demonstrate strong professional capacity through systematic, incremental program development and implementation

additional information surveys of ICM course participants, participant reports

3 3 Bi- and tri-national Strategic Planning

Progress in the development and implementation of strategic plans by the tri- and bi-national alliances of NGOs

0 = no strategic planning

1 = at least one strategic planning exercise conducted in all four project sites but draft plans not completed or not implemented

2 = strategic plans completed in at least two project sites

3 = strategic plans completed and implemented in at least two project sites

4 = plans completed and implemented in all four sites

4 LOCAL/NATIONAL POLICY IMPLEMENTATION INDEX
(applied to key management issues)

TABLE 2 STAGES OF PROGRESS TOWARDS POLICY GAP ELIMINATION (applied to each key management issue in each country)	POINTS TOWARD COMPLETION OF FINAL OBJECTIVE (0-100)
1 Technical team formed to conduct policy gap analysis and guide the process of policy gap elimination, agreement reached on project methodology	5
2 General analysis conducted to identify norms, institutions and policies associated with key management issues in protected areas and coastal-marine zones and describe them in simple language	15
3 Site-specific key management issue described and responsibilities and interests of stakeholder groups defined	30
4 Map(s) produced to visually describe the scope and location of the key management issue	35
5 Policy constraints/gaps (gap between the intention of the law and the reality in the field) defined, including possible causes, location, winners/losers, and relevant administrative procedures	45
6 Multisectoral working group formed to participate in resolution of policy constraint or policy reformulation	60
7 Multi-level consultations conducted governmental and non-governmental stakeholders at grassroots and national levels participate in decision-making and communicate vertically to contribute to the development of solutions	70
8 Multisectoral working group proposes actions needed (presents draft regulations, proposes specific mechanisms for interinstitutional coordination, etc)	85
9 Feedback on proposed action received from government ministries and institutions, NGOs and private sector groups on the local and national levels	90
10 Proposed actions accepted by the relevant government agency(ies) and necessary action initiated to eliminate policy constraint	100

5 REGIONAL POLICY INDEX

5 1 International Agreement on Management/Policy Priorities Among Countries Sharing Coastal Ecosystems

Extent of bi- or tri-national agreement on management/policy priorities for key management issues in shared coastal ecosystems

0 = management/policy priorities established within each country, with no recognition that the coastal ecosystem is shared with other countries

1 = initial steps toward communication and collaboration across borders

2 = active bi- or tri-national communication and collaboration between governmental and non-governmental management entities concerning management/policy priorities for shared coastal ecosystems

3 = formal bi- or tri-national agreement reached between the governmental authorities and non-governmental management entities concerning management/policy priorities related to the key management issue

4 = specific steps undertaken bi- or tri-nationally to strengthen policy implementation

5 2 Regional Decision-Making Fora Incorporate Coastal-Marine Information/Priorities in Their Policy Setting Process

Extent of incorporation of coastal-marine information and priorities in the regional policies developed through high-level decision-making fora

0 = coastal-marine information and priorities not taken into account in the development of regional natural resource policies

1 = a few regional decision-making fora consider coastal-marine information/priorities

2 = a few regional decision-making fora incorporate coastal-marine information/priorities

3 = several regional decision-making fora incorporate coastal-marine information/priorities

4 = coastal-marine information and priorities recognized as equally important as terrestrial information and priorities, and incorporated thoroughly into the regional policy-setting process

6 INSTITUTIONAL STRENGTHENING INDEX

Part A Leadership and Management

6 1 Clear Mission Statement

Extent of clarity and common understanding of mission statement and long-term goals

0 = No mission statement
1 = Mission statement very broad and/or unclear, major disagreement over its interpretation
2 = Mission statement somewhat unclear and open to interpretation
3 = Mission statement fairly clear
4 = Mission statement very clear and specific

6 2 Annual Strategic Planning

Extent to which strategic planning is conducted and results utilized to guide the activities of the NGO

0 = Organization has never conducted strategic planning
1 = Organization has conducted strategic planning at irregular intervals, but has not implemented the plans
2 = Organization conducts strategic planning at irregular intervals and implements portions of the plans
3 = Organization conducts strategic planning at regular intervals and implements portions of the plans
4 = Organization conducts strategic planning annually and implements the plans

6 3 Decision-making Ability of the NGO

Ability of the organization s leaders to make strong timely decisions consistent with the mission of the organization

0 = Organization's leaders tend to avoid making decisions, usually follow the leadership of others, or make poor decisions
1 = Organization's leaders tend to be reactive rather than proactive, making decisions in an inconsistent manner, possibly in response to emergencies rather than vision and planning
2 = Organization's leaders occasionally make good, timely decisions
3 = Organization's leaders fairly frequently make good, timely decisions
4 = Strong ability of organization's leaders to make decisions in a timely manner that present a clear vision of the direction and priorities of the organization

6 4 Committed, Efficient Board of Directors

Level of commitment activity and efficiency of Board of Directors

0 = Significant problems with the Board of Directors, including major turnover, inconsistent attendance at meetings, and/or lack of activity
1 = A few Board members are active and committed
2 = Several Board members are active and committed, and the Board sometimes works efficiently as a group
3 = Many Board members are active and committed, and the Board sometimes works efficiently as a group
4 = Many Board members are active and committed, and the Board usually works efficiently as a group

Additional Information % of Board of Directors that are women, % that are indigenous

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6 5 Defined Standards of Ethics

Extent of definition and promotion of the organization s standards of ethics

0 = No standards of ethics defined in written form

1 = Standards of ethics being developed

2 = Standards of ethics defined in written form but not followed by all staff members

3 = Standards of ethics defined in written form and followed by most staff members

4 = Standards of ethics defined in written form and followed by all or almost all staff members

Part B Programs

6 6 Strategic Selection of Programs

Extent to which selection of programs is consistent with the mission, long-term goals and capacity of the organization

0 = Programs selected primarily on the basis of outside opportunities (such as available funding), with little regard to the mission of the organization

1 = Some initial attempts being made to select programs strategically

2 = More than half of programs selected strategically

3 = Programs usually selected strategically, but sometimes selected in response to outside opportunities

4 = Programs consistently selected based on the mission and strategic planning of the organization

6 7 Efficient Management of Programs

Extent to which programs are well-planned implemented, and documented, and achieve intended results in a timely fashion

0 = poor program management due to inadequate planning and documentation, and lack of achievement of intended results

1 = initial steps toward improvement of program management

2 = programs meet some results in a fairly timely fashion, through improvements in program management

3 = programs meet most results in a timely fashion through good planning, implemention and documentation

4 = major success in achievement of intended results within a timely fashion due to strong program planning, implementation and documentation

6 8 NGO Conducts Periodic Evaluation of Programs

Progress in utilization of periodic evaluations based on carefully selected criteria

0 = Programs never evaluated

1 = Some attempts being made to evaluate programs

2 = Programs evaluated, but improvements in evaluation criteria needed

3 = Programs evaluated irregularly, based on a well-developed evaluation methodology

4 = Programs evaluated periodically, based on a well-developed evaluation methodology

6 9 Stakeholder Involvement in Programs

Extent of local involvement and ownership of the NGO s programs

0 = No involvement of stakeholders

1 = A few stakeholders involved in programs, as beneficiaries

2 = A few stakeholders involved in program implementation

3 = Many stakeholders involved in program implementation and some involved in program planning

4 = Stakeholders thoroughly involved in program planning and implementation

C Human Resources

6 10 Descriptions of All Positions

Extent of availability of clear accurate thorough position descriptions

0 = No position descriptions available
1 = Position descriptions being developed
2 = Position descriptions available for a few positions but are not sufficiently detailed
3 = Position descriptions available for several positions
4 = Thorough, well-written position descriptions available for most or all positions

6 11 Standards and Operating Procedures for Personnel

Extent to which standards and operating procedures are presented clearly to personnel

0 = No staff manual or other documentation of standards and operating procedures
1 = Staff manual being developed
2 = Staff manual covers some standards and operating procedures
3 = Staff manual covers most standards and operating procedures
4 = Staff Manual thoroughly describes standards and operating procedures

6 12 Employee Evaluation

Extent to which evaluations are conducted regularly based on clearly defined criteria, to improve performance

0 = No employee evaluations conducted
1 = Some efforts undertaken to evaluate employee performance, but criteria for evaluation not clearly established
2 = Employee evaluations conducted on an irregular basis, criteria for evaluation fairly clear
3 = Employee evaluations conducted on an regular basis, criteria for evaluation fairly clear
4 = Employee evaluations conducted on a regular basis, using very clearly established criteria, and recommendations provided to improve performance

6 13 Professional Development Opportunities

Extent of availability and fair distribution of professional development opportunities

0 = no professional development opportunities
1 = professional development opportunities rare
2 = professional development opportunities provided inconsistently to a few employees
3 = professional development opportunities provided to several employees
4 = professional development opportunities provided to all personnel

Additional Information % of staff that are women, % that are indigenous

Part D Financial Resources

6 14 Fundraising for Projects and Operations

Success in fundraising

0 = No fundraising for projects and operations
1 = Initial efforts to fundraise for projects and operations, with very little success
2 = Small level of success in fundraising for projects and operations
3 = Moderate level of success in fundraising for projects and operations
4 = Significant level of success in fundraising for projects and operations

6 15 Financial Self-Sufficiency

Ability to generate funds through membership programs and business initiatives

0 = Complete dependence on outside funding, no generation of funding
1 = Initial efforts to generate funding
2 = Small level of success in generating funding
3 = Moderate success in generating funding
4 = Little dependence on outside funding, significant generation of funding

6 16 Efficiency of Financial Administration

Ability to keep clear thorough, timely financial records

0 = no records or very poorly organized records
1 = initial steps towards organization and timeliness in financial administration
2 = moderate progress towards organization and timeliness in financial administration
3 = major progress towards organization and timeliness in financial administration
4 = financial records well-organized, complete and kept up-to-date

6 17 Financial Reports Complete and On Time

Ability to produce complete financial reports on time

0 = no financial reports
1 = financial reports often presented late and/or incomplete
2 = financial reports sometimes presented late and/or incomplete
3 = financial reports occasionally late and/or incomplete
4 = financial reports consistently thorough, well-organized and presented on time

Part E Communication and Collaboration

6 18 Clear Flow of Internal Communication

Extent to which communication about significant issues flows through all levels of the NGO to support decision-making

0 = communication poor, causing frequent misunderstandings, internal conflicts and/or gaps in decision-making processes

1 = common problems in internal communication

2 = fairly common problems in internal communication

3 = occasional problems in internal communication

4 = very clear flow of internal communication

6 19 Regular Communication with Government Entities (External Entities??)

Extent to which the NGO communicates with relevant government entities

0 = no communication

1 = infrequent/irregular communication

2 = effort to improve communication and strengthen relationship with government entities

3 = fairly regular communication

4 = regular communication

6 20 Mission and Achievements Known by the Public

Level of public awareness of the mission and achievements of the NGO

0 = no adequate means utilized to disseminate information concerning the mission and achievements of the organization

1 = effort undertaken to identify target public

2 = target "public" identified, and small portion of this public aware of the mission and achievements of the NGO

3 = target "public' identified, moderate awareness of the mission and achievements of the organization

4 = target "public' identified and the majority aware of the mission and achievements of the organization

6 21 Capacity to Build Strategic Alliances

Extent to which the NGO collaborates on a continuous basis with other groups through strategic alliances (ex tri-national alliances) to address problems

0 = No collaboration with other groups

1 = NGO recognizes interests shared with other groups and explores possibilities for collaboration

2 = At least one strategic alliance built but little activity undertaken

3 = At least one strategic alliance built and collaborative activity undertaken

4 = More than one strategic alliance built and collaborative activity undertaken

]

6 22 Power of Assembly

Ability of the organization to convoke local supporters and influence decision-making

0 = very little or no response or influence demonstrated through public events

1 = small level of public response or influence demonstrated

2 = moderate public response and influence demonstrated

3 = fairly strong support demonstrated through turnouts at public events and influence in decision-making

4 = very strong support demonstrated through large turnouts at public events and substantial influence in decision-making

ANNEX D LIST OF HISTORIC BUILDINGS IN BLACK RIVER TOWN

Following is an adaptation of a descriptive list of buildings of historic interest prepared in 1988 by Elizabeth Causwell of the Jamaica National Heritage Trust (The reference numbers are those used to identify buildings on the annotated street maps and to cross reference them to photographs The maps need to be obtained and the list updated)

HIGH STREET

1	The Riverside	Contains two warehouses one on either side and a jetty to the north The character of these warehouses should be maintained They could function efficiently present condition
2	Hendrick s Wharf	A complex of commodity stores and between Market Street and the river, of varying periods (one has A D 1913 on its facade), mainly substantial buildings built of brick (sometimes rendered) except for covered shed

The next section of the street on both sides generally contains modern (or modernised) buildings The following need to be identified as of particular interest

More Contemporary Urban Buildings in a Classical Form

3	No 4	The Collectorate
4	No 6	Bank of Nova Scotia

Buildings with Georgian Vernacular Characteristics

5	No 16	
6	No 22	
7	No 26	
8	No 28	
9	No 30	Until hurricane "Gilbert" the shop had a monstrous aluminum framework covering its entire facade in order to support an advertising sign The opportunity now exists to fully restore the original frontage
10	No 32	The Parish Church
11	No 32	A 2 - storey timber building on the corner of Church Street requiring facade upgrading commensurate with its important location
12	No 34	Dentist's- Surgery A 2 storey Georgian building in poor condition It is imperative that this building be repaired rather than demolished (reported to have been condemned by the Parish Council) since it greatly contributes to the aesthetics of the street
13	No 42	Attorney's Chambers is a small wooden building with good detailing
14	No 44	Waterloo Guest House is a prosperous and well kept Georgian building The owner intends to expand by adding rooms The owner lives in a well designed modern building to the rear which is in keeping with the original house Note John Leyden's tomb (and that of his dog) Is located at the rear of the property The owner Mrs Allen intends to restore this from its rather dismembered condition
15	No 48	Dr Bown's House and Surgery is a medium to large two storey building with good fretwork but requiring repair
16	No 50	House (Mrs Graw) was once a handsome two storey building However it is now in a decrepit condition (both interior and exterior and occupied by squatters

17	No 52	A small wooden structure well cared and occupied by a lawyer s office The elevated ground floor is a distinguished feature of this building
18	No 54	Parish Health Offices is a two storey building with good fretwork in the vernacular style
19	No 56	Parish Council Offices is a well-kept one storey wooden structure in the vernacular style
20	No 58	The Court House is a magnificent Georgian structure going to seed" but only in a superficial manner It would be advisable if the later extensions could be removed so that the building could be seen from all sides The Public Works Department appears to be using the rear yard for parking its vehicles
21	No 60	PWD Residence
22	No 64	Invercauld is an outstanding two storey residence with fretwork and external features that are unique to Black River However it now in a state of disrepair Major restoration works will be required if this building is to be returned to its original magnificence **(Since restored)**
23	No 68	Magdala - This property owned by the Catholic Church is similar to "Invercauld in both its original magnificence and its present state of disrepair It stands on a very large plot of land where potential (and sympathetic) development could be conditional upon the restoration of the original residence
24		A well kept house with the same gable treatment as Magdala
25	No 1	A large yard with two brick warehouses used as a tile factory and storage The original weighscales from the logwood trade remain
26	No 7	A conglomeration of three (3) shops one of which has an advertising sign that virtually conceals the original cast iron brackets that support the upper storey overhang
26	No 15	An old warehouse of concrete frame and in fill construction The intention of adding an upper storey to the adjacent small shopping centre (No 17) and linking the two properties must be carried out sympathetically The open space at ground floor level should be maintained in order to preserve the view of the sea from Main Street
28	No 19	A two storey shop

The identification of an agglomeration of small shops and businesses which in their entirety create the very essence of the architectural quality and ambience of downtown Black River are listed as follows

29 NO 21
30 No 23
31 No 27
32 No 33
33 No 35

Three (3) good examples of single storey wooden vernacular houses on the south side of Main Street before the General Public Hospital are identified below

34 No 39
35 No 41
36 No 43
37 The General Public Hospital

CHURCH SQUARE

38	The Manse	A fine two storey residence incorporating balconies with excellent fretwork encircling both storeys The house stands in beautiful landscaped of grounds
39	Old Police Station	The compound comprises a number of buildings including the Station House Jail Garage and Mess It is enclosed by a high stone wall which forms part of a number of the buildings with wall construction on the upper floors It incorporates many traditional architectural features, including jalousies and sash windows, canopies and overhanging eaves supported on timber brackets and plays an important role in defining the north side of Church Square

NORTH STREET

40	No 2	Two storey shop-house
41	No 6	Shop house
42	No 10	NWC Office
43	No 16	Single storey timber house, Forbes Upholstering
44	No 30	Two storey timber shop-house
45	No 32	Timber above brick shop-house
46	Methodist Church	
47	House above New Police Station Small house with good fretwork	

SCHOOL STREET

48	Stratford High School
*49 - 53	Small houses

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